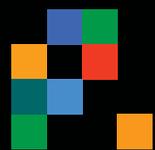PRINCIPLES FOR DIGITAL DEVELOPMENT
COMMUNITY INSIGHTS

PRINCIPLES *for*
Digital Development

INTRODUCTION

For over a decade now, the international development community has
been exploring how the use of modern information and communications
technologies, tools like the mobile phone, can extend the reach of development.
At the same time, development organizations have grappled with how to use
these technologies to make their own work more participatory, sustainable,
and effective.

We've seen great successes, where programs enable access to information and
services that previously were out of reach for some of the most marginalized
and vulnerable populations. But we've also seen a lot of failure. This has included
project failure for predictable and preventable reasons, resulting in hundreds,
if not thousands of projects that were unable to scale beyond the pilot stage,
contributing to the waste of scarce resources.

Starting in the late 2000s, several large donors and multilateral organizations
began talking about failure in using information and communications technology
for development (ICT4D). Soon, sets of principles, lessons, and best practices
started emerging, beginning with the UNICEF Innovation Principles in 2008.
One year later, a group of 40 mHealth implementers and donors met and
independently developed a different set of principles known as the Greentree
Principles. These two sets of principles were organized and worded differently,
but they encompassed the same ideas. In 2012, a group of donors convened and
agreed on the need for a common aspirational vision to help the development
community learn from past mistakes. By combining the previous sets of
principles and refining their concepts, the Principles for Digital Development
were born.

Since June 2014, members of the international development community have
convened to hold detailed discussions about each of the nine Principles. These
sessions were hosted by Creative Associates International, Dalberg Global
Development Advisors, Internews, John Snow Inc. , Catholic Relief Services,
Abt Associates, Palladium (formerly Futures Group), the National Democratic
Institute, Mercy Corps, IDEO.org, United Nations Global Pulse, and FHI 360.
The following documents are a reflection of the community dialogue that
resulted from these events, expanding on what the Principles mean in practice
and exploring how to identify and overcome barriers to their successful
operationalization. We hope that you will contribute to the ongoing conversation
via the Principles website at **digitalprinciples.org**, on Twitter using
#digitalprinciples, and through the Principles Working Group at
https://goo.gl/wcsPJF.

PRINCIPLES FOR DIGITAL DEVELOPMENT

The following set of principles represents a concerted effort by donors to capture the most important lessons learned by the development community in the implementation of technology-enabled programs. Having evolved from a previous set of implementer precepts endorsed by over 300 organizations, these principles seek to serve as a set of living guidelines that are meant to inform, but not dictate, the design of technology-enabled development programs.

ONE: DESIGN WITH THE USER

❯ Develop context-appropriate solutions informed by user needs.

❯ Include all user groups in planning, development, implementation, and assessment.

❯ Develop projects in an incremental and iterative manner.

❯ Design solutions that learn from and enhance existing workflows, and plan for organizational adaptation.

❯ Ensure solutions are sensitive to, and useful for, the most marginalized populations: women, children, those with disabilities, and those affected by conflict and disaster.

TWO: UNDERSTAND THE ECOSYSTEM

❯ Participate in networks and communities of like-minded practitioners.

❯ Align to existing technological, legal, and regulatory policies.

THREE: DESIGN FOR SCALE

❯ Design for scale from the start, and assess and mitigate dependencies that might limit ability to scale.

❯ Employ a "systems" approach to design, considering implications of design beyond an immediate project.

❯ Be replicable and customizable in other countries and contexts.

❯ Demonstrate impact before scaling a solution.

❯ Analyze all technology choices through the lens of national and regional scale.

❯ Factor in partnerships from the beginning, and start early negotiations.

FOUR: BUILD FOR SUSTAINABILITY

❯ Plan for sustainability from the start, including planning for long-term financial health, e.g., assessing total cost of ownership.

❯ Utilize and invest in local communities and developers by default, and help catalyze their growth.

❯ Engage with local governments to ensure integration into national strategy, and identify high-level government advocates.

FIVE: BE DATA DRIVEN

- Design projects so that impact can be measured at discrete milestones with a focus on outcomes rather than outputs.

- Evaluate innovative solutions and areas where there are gaps in data and evidence.

- Use real-time information to monitor and inform management decisions at all levels.

- When possible, leverage data as a by-product of user actions and transactions for assessments.

SIX: USE OPEN DATA, OPEN STANDARDS, OPEN SOURCE, OPEN INNOVATION

- Adopt and expand existing open standards.

- Open data and functionalities, and expose them in documented APIs (Application Programming Interfaces) where use by a larger community is possible.

- Invest in software as a public good.

- Develop software to be open source by default with the code made available in public repositories and supported through developer communities.

SEVEN: REUSE AND IMPROVE

- Use, modify, and extend existing tools, platforms, and frameworks when possible.

- Develop in modular ways favoring approaches that are interoperable over those that are monolithic by design.

EIGHT: ADDRESS PRIVACY & SECURITY

- Assess and mitigate risks to the security of users and their data.

- Consider the context and needs for privacy of personally identifiable information when designing solutions and mitigate accordingly.

- Ensure equity and fairness in co-creation, and protect the best interests of the end-users.

NINE: BE COLLABORATIVE

- Engage diverse expertise across disciplines and industries at all stages.

- Work across sector silos to create coordinated and more holistic approaches.

- Document work, results, processes, and best practices, and share them widely.

- Publish materials under a Creative Commons license by default, with strong rationale if another licensing approach is taken.

DESIGN WITH THE USER

Too often in the field of international development technology tools are created, or tech-enabled projects are designed, without sufficient input from the stakeholders whose engagement and ownership are critical to long-term success. Principle #1: Design with the User provides recommendations to avoid this common pitfall.

WHAT IT MEANS

› Develop context-appropriate solutions informed by user needs.

› Include all user groups in planning, development, implementation, and assessment.

› Develop projects in an incremental and iterative manner.

› Design solutions that learn from and enhance existing workflows, and plan for organizational adaptation.

› Ensure solutions are sensitive to, and useful for, the most marginalized populations: women, children, those with disabilities, and those affected by conflict and disaster.

ABOUT THE PRINCIPLES

As the international development community matures in its use of information and communications technologies, many hard lessons have been learned. The Principles for Digital Development are "living" guidelines, designed to be updated and refined over time, which can help international development practitioners integrate established best practices into technology-enabled programs. This document is one of a series taking a closer look at each Principle. For more information visit **digitalprinciples.org**.

CASE STUDY

Access to information is critical for subsistence farmers in rural India, yet many live beyond the reach of the Internet and are either illiterate or otherwise not comfortable with text messaging. To reach these farmers, Indian social media start-up Awaaz.De designed a radio call-in program leveraging regularly used voice-based communications channels.

To gather the information needed to design a solution that met farmers' needs, Awaaz.De team members spent time talking to farmers in Gujarat to understand their farming practices, and to better understand farmers' motivations, openness to new ideas, and willingness to change. This led them to identify and design for "lead users," or early adopters whose use of the solution would help socialize it among the wider community.

Based on its analysis, Awaaz.De determined that farmers would benefit from a system that enabled browsing, searching, and filtering of all questions that were being posed to the call-in program hosts, not just those that made it on air. The resulting product was a digital, voice-based content publishing platform that supports peer-to-peer knowledge exchange, enabling information exchange beyond the times of the call-in radio program.

A subsequent evaluation showed that farmers found being able to learn from the questions and experiences of others to be the biggest benefit of the program. For more information visit **http://goo.gl/FCEB59**.

COMMUNITY INSIGHTS

› Make products and solutions intuitive to the end user by applying concepts of "design thinking," which employs a user-centered and prototype-driven process.

› Be "user-centered" by keeping user needs, environment, and preferences at the center of project and product design.

› Increase the local relevance, utility, and sustainability of products and services by encouraging early, direct, and sustained collaboration with the target user community.

› Be "prototype-driven" by testing frequently with the user community, ideally starting with a "minimum viable product," or a rough idea in unfinished form, that can gather feedback well before products are put into a formal design process.

› Be willing to embrace failure to learn what works, recognizing that failure is an important part of the learning process.

› Sketching out visual representations of complex systems can be an effective means of conveying unfinished concepts, particularly when collaborating with low literacy user communities.

› Use "rapid prototyping" to refine rough ideas, test underlying assumptions, and draw principles of monitoring & evaluation into the earliest stages of design.

› Use "participatory design" to engage all stakeholders involved in eventual products, services, and business processes to ensure they are responsive and appropriate for user preferences, environments, and behaviors.

› Create individual "user personas" that represent the needs and desires of major stakeholder groups to facilitate a clearer understanding of the impact that potential design choices on user groups.

Try the use of role-playing, particularly when direct engagement with users isn't feasible, to reveal new insights and achieve mutual understanding in working with target users and communities.

› Create a direct loop between the feedback of target end user communities and product ideation, prototyping, and development by letting users know how their feedback has been incorporated in project or product design.

› Design not just for where the user is now, but where the user will be in the future.

› Design collaboratively with other providers, including by building on existing platforms, tools, and services whenever possible.

› Consider describing your design methodology and iterative digital development approach in proposals as a way to secure funds for this work, and to illustrate how it can lead to the development of more sustainable solutions.

RESOURCES

› Design Research for Media Development: A Practitioner's Guide
Internews
http://goo.gl/rIRZWv

› Designing for the Science of Service Delivery
Stanford Social Innovation Review
http://goo.gl/cV42Bi

› Design Kit
IDEO
http://goo.gl/QKZY3E

› Harnessing Design for Media Development
Internews
http://goo.gl/y78ZxC

› Building Human-Centered Design Into ICT4D Projects
United Methodist Communications
http://goo.gl/3uc60j

› Design Sketch Cards
Medic Mobile
http://goo.gl/AmIkdk

UNDERSTAND THE ECOSYSTEM

To increase the relevance and sustainability of technology-supported international development, Principle #2: Understand the Ecosystem provides recommendations about how to ensure projects and programs are built, managed, and owned with consideration given to the local ecosystem.

WHAT IT MEANS

› Participate in networks and communities of like-minded practitioners.

› Align to existing technological, legal, and regulatory policies.

CASE STUDY

Particularly during the early days of the 2014 Ebola outbreak, there was a huge need for detailed mapping, health, operational, and other information, but limited actionable data sets available. To identify and meet data needs, a variety of actors involved in health and humanitarian information aspects of the Ebola response coordinated using Skype.

The Skype IM/GIS (Information Management/Geographic Information Systems) chat in particular served as a clearinghouse for requests for geolocation information, and the tasking of creating new maps. This included mapping unmapped areas in Ebola-affected countries, and creating overlays such as the location of Ebola treatment units and community care clinics.

Over 220 individuals from more than 100 organizations joined the chat, some in their official capacity, others as off-hours volunteers. The chat group grew organically, as existing members invited new members. Where group discussions became specialized, new chat rooms were opened.

This channel supplemented existing, formal coordination mechanisms, and was used by staff in the field and at headquarters. It is attributed with helping to increase the identification of, and delivery against, Ebola response GIS needs across organizations, geographies, and time zones, and illustrates how an open model of ecosystem engagement can enable relevant actors to self-identify and self-organize.

ABOUT THE PRINCIPLES

As the international development community matures in its use of information and communications technologies, many hard lessons have been learned. The Principles for Digital Development are "living" guidelines, designed to be updated and refined over time, which can help international development practitioners integrate established best practices into technology-enabled programs. This document is one of a series taking a closer look at each Principle. For more information visit **digitalprinciples.org**.

COMMUNITY INSIGHTS

WHAT IT MEANS

> Consider what "ecosystem" means in the context of your work. Some use it to refer just to agents, (such as individuals, institutions, or communities); others use it to refer agents and the broader systems in which they act, (such as the surrounding legal, technical and political environment, and the process by which information collected, curated, analyzed, shared, and used.) This document uses the latter definition.

UNDERSTANDING THE ECOSYSTEM

> Allocate time and resources to gather information about, understand, and engage with the context and communities in which your project or program will be deployed.

> Use a whiteboard to map out key ecosystem components.

> Consider all actors, including institutions, communities, and individuals. Within institutions, think about different actors/roles that may be relevant, such as in a workflow analysis.

> Consider the regulatory environment, including policies, laws, and other rules that may impact how tech-supported development projects are owned and can operate.

> Consider the political environment, including how changes in political parties could change personnel, structure, and/or mandates of government ministries.

> Consider the technical environment, including standards, platforms and tools, to maximize interoperability and encourage reuse and/or adaptation of existing tools as relevant.

> Consider systems, including the processes by which information is shared, and how capacity is built around information to refine knowledge and institutionalize it as practice.

ENGAGING THE ECOSYSTEM

> Identify networks of trust and influence in the ecosystem; these will provide key connections and distribution mechanisms for impact.

> Identify and leverage conduits and processes that are appropriate and effective, and use these to inform intervention design.

> Combine an information ecosystems approach with human-centered research to create a systemic view of local dynamics and emergent behaviors. Use these insights to inform program or project design, and maximize impact.

> Consider strengths and weaknesses in local systems by examining the 5 R's: roles, resource, relationships, rules, results. (See p.8 in the Local Systems Framework linked in the Resources section below.)

> Consider using an open, crowdsourced approach that enables relevant actors to self-identify and self-organize. (See case study as an example.)

> Think about how to make an ecosystem more inclusive, such as by using influence to empower marginalized actors.

> Design to enable feedback loops to strengthen the ecosystem and make tech-supported interventions sustainable.

> Consider resources and incentives. What value do critical stakeholders derive from your intervention to make it relevant and sustainable over the long term?

> Consider the drivers of the ecosystem, both as it exists today and in the future.

RESOURCES

> Humanitarian Data Exchange, or HDX (UN OCHA)
> **http://goo.gl/f58xxn**

> Local Systems: A Framework for International Development (USAID)
> **http://goo.gl/56p5gE**

> The Busan Partnership for Effective Development Cooperation (OECD)
> **http://goo.gl/LIRUDh**

> The Ecosystem of U.S. International Development Assistance (CSIS)
> **http://goo.gl/LlsTa7**

DESIGN FOR SCALE

Too often international development projects fail to move beyond the pilot stage, or to reach anticipated scale. In some cases, scale is not a necessary criterion for success. In others, careful consideration of the necessary inputs can help projects reach their full potential. Principle #3: Design for Scale provides considerations for how to design a project for maximum impact.

ABOUT THE PRINCIPLES

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WHAT IT MEANS

> Design for scale from the start, and assess and mitigate dependencies that might limit ability to scale.

> Employ a "systems" approach to design, considering implications of design beyond an immediate project.

> Be replicable and customizable in other countries and contexts.

> Demonstrate impact before scaling a solution.

> Analyze all technology choices through the lens of national and regional scale.

> Factor in partnerships from the beginning and start early negotiations.

CASE STUDY

Aligning digital development projects with regional and national management information systems is a key component of moving to scale. District Health Information Software version 2 (DHIS 2) is a free, web-based, and open source software tool used at scale in a dozen countries to support the collection and use of health indicators. Key components of scale include: adaptability through use of global standards; interoperability with apps, portals and other information systems; and "Academies" dedicated to supporting the user community. For more information, visit **www.dhis2.org**.

COMMUNITY INSIGHTS

- Identify what "scale" means in the context of your project, acknowledging that the term can mean different things to different people.

- In defining what scale means for your project, consider factors such as: geographic reach; number of active users; and institutionalization of tools and/or related processes among user groups, such as the host government.

- Ask whether and what kind of scale is appropriate for your project.

- To generate the demand necessary to move a product to scale, design collaboratively with local experts and partners, and identify user preferences.

- Align Information and Communications Technology (ICT) interventions to existing business processes and workflows to avoid increasing the user's workload.

- Consider what inputs and components of a supporting ecosystem are required to grow a project from an initial intervention to impact at scale.

- Understand the partners, including the local private sector, whose collaboration and buy-in will be necessary for long-term project viability.

- Understand and attempt to align motives for various partners involved in scaling.

- Ask what resources and capacity are needed to be able to finance and manage scale over time.

- Consider adapting existing, open source solutions or using off-the-shelf products instead of starting from scratch.

- Use standards to ensure that data from the intervention can be integrated and interpreted by the appropriate players as it moves from pilot to scale.

- Consider how to measure adoption and utility, and how these measurements may change as the intervention moves to scale.

- Be open to adaptation and iteration of a concept to reach scale; demonstrate impact but don't try to perfect the intervention before it is deployed on an initial small scale.

- Think through potential unintended consequences or outcomes.

RESOURCES

- The Journey to Scale: Moving Together Past Digital Health Pilots
  PATH
  http://goo.gl/1Ri5gY

- Designing Systems at Scale
  IDEO
  http://goo.gl/Jjl4GV

- Achieving Lasting Impact at Scale: Behavior Change and the Spread of Family Health Innovations in Low-Income Countries
  Gates Foundation
  http://goo.gl/BjTmZn

- Scaling Up the mHealth: Where is the Evidence?
  PLOS|Medicine
  http://goo.gl/TUj0up

BUILD FOR SUSTAINABILITY
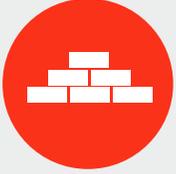
Too often international development projects fail to factor in the physical, human, and financial resources that will be necessary for long-term sustainability. Principle #4: Build for Sustainability outlines considerations that can support a project's longevity for the intended duration.

WHAT IT MEANS

> Plan for sustainability from the start, including planning for long-term financial health, e.g., assessing total cost of ownership.

> Utilize and invest in local communities and developers by default and help catalyze their growth.

> Engage with local governments to ensure integration into national strategy, and identify high-level government advocates.

CASE STUDY

In Jalalabad and elsewhere in Afghanistan, wholesalers now send text messages to farmers with information about commodities they can use to increase crop yields. The SMS program began with seed funding and is now self-sustaining through revenues wholesalers have generated through increased sales. These sales, in turn, are being fueled by farmers whose crop yields have increased through information they have gained by SMS about the proper use of fertilizers, pesticides, and other agricultural commodities.

The pilot, called the Idea-New project, entailed market research to ensure and align business and development interests; collaborative design with local stakeholders (including workshops with wholesalers and farmer surveys); technical assistance for all stakeholders; seed funding via grants for wholesalers. After seeing increased revenues, 100% of the wholesalers involved in the pilot continued the SMS program using their own funding.

ABOUT THE PRINCIPLES

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COMMUNITY INSIGHTS

› Carefully consider what long-term financial investments, like system maintenance and support, capacity building, and monitoring and evaluation, are necessary to achieve sustainability of operations.

› Anticipate essential non-monetary resources, like trust and buy-in, will be necessary to achieve sustainability of ownership after the pilot phase.

› Ensure incentives are aligned by testing and confirming the value proposition for all stakeholders in the ecosystem: public, non-profit, private sector, delivery agents, households, and individuals.

› Think local: local experts are better suited to localizing content and implementing support, and localized business models are more likely to succeed.

› Keep it simple: the simpler the value chain, the more likely the success.

› Identify what ongoing funding types are necessary as a project evolves: seed funding, as for a pilot project which results in a system that pays for itself after initial implementation (such as through cost savings); gap funding, as to bridge to scale after which it pays for itself; or ongoing funding from an economic buyer that derives continuing value from the solution.

› Partner, partner, partner: Engage the government and the local private sector actors which have an interest in the communities the system is designed to serve.

› Think about how outputs become impact: what resources are necessary to empower local stakeholders to drive decisions and make change? What methods are needed to monitor the local environment and adjust the system as the environment changes?

RESOURCES

› Organizational Guide to ICT4D: Leveraging Technology for International Development
Catholic Relief Services/NetHope
http://goo.gl/UkRprD

› Five Steps Toward Designing Context Appropriate ICT4D Projects
United Methodist Communications
http://goo.gl/PxkWoc

› ICT Sustainability Primer
Inveneo
http://goo.gl/aSqYMb

› Planning an Information Management System
PATH
http://goo.gl/XDhz2C

› Closing the Feedback Loop: Can Technology Bridge the Divide?
World Bank
http://goo.gl/rTRmgy

BE DATA DRIVEN

Too often international development projects fail to fully leverage data to support project planning and decision-making. Principle #5: Be Data Driven provides tips to identify the sources of and incorporate data project design and decision-making.

WHAT IT MEANS

› Design projects so that impact can be measured at discrete milestones with a focus on outcomes rather than outputs.

› Evaluate innovative solutions and areas where there are gaps in data and evidence.

› Use real-time information to monitor and inform management decisions at all levels.

› When possible, leverage data as a by-product of user actions and transactions for assessments.

CASE STUDY

Health facility workers in Uganda report drug stock level and disease surveillance data using mTrac, an SMS and web-based data collection system. At the district level, health teams use the mTrac dashboard to review, verify and approve the data submitted. mTrac supports data-driven decisions by providing decision-makers with rapid insight on supply chain and other ecosystem components required to effectively deliver drugs and identify potential outbreaks. When mTrac users identify errors, they can send a free SMS to the reporting health worker with a request to review and correct the data. The dashboard also surfaces facilities that are failing to report data, making it possible to follow up in real-time. mTrac is built on the open source RapidPro software platform, a white label version of TextIt.

ABOUT THE PRINCIPLES

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COMMUNITY INSIGHTS

› Treat data as a critical, fundamental building block to international development. It should inform how interventions are designed, implemented, and evaluated.

› Understand what constraints, including limited access to physical, financial, technical, or human resources, may limit access to timely and accurate data.

› Consider the implications of various constraints, from a "data gap," in which data is simply unavailable, to a "usability gap," in which limitations restrict the utility of available data due to a lack of resource or capacity.

› Incorporate agile methodologies that enable analysis of data collected a month, a day, or even an hour ago, in addition to traditional methodologies reliant on evidence-based studies that are peer reviewed and published.

› Draw from a variety of data sources, including traditional collection modalities (e.g. , via surveys or enumerators), "big data" (e.g. , by-products of digital user actions and transactions), and "open data" (e.g. , license-free public data, such as that provided by a government).

› Use data to improve service delivery by creating a feedback loop between data, analysis, decision-making, and action.

› Achieve maximum impact by planning ahead for the strategies and resources (and in some cases dedicated staff) that enable data collected and interpreted to be used.

› Use performance metrics data to improve system design and user experience.

› Partner with local actors to ensure that data collection, interpretation, analysis, and data driven action matches with community needs.

› Support the ability of local partners to make changes based on insights generated by data-driven development.

› Ensure that adequate privacy and security measures are in place to protect the individuals about whom data is being collected and used.

› Ask where there are vulnerabilities of information collection, sharing and communication within the intended users and/or target audience of the project, and with the technology being used to gather, analyze, and house the data.

› Carefully consider taxonomy, as how data is categorized will influence how it is interpreted and used.

› Use standards to wherever possible to facilitate data analysis and sharing.

› Leverage and contribute to existing data repositories whenever appropriate to grow the data commons.

RESOURCES

› Mobile Data Solutions
  TechChange
  http://goo.gl/tHvrzY

› Big Data Big Impact: New Possibilities for International Development
  World Economic Forum
  http://goo.gl/VVh93Y

› Data-Driven Development: Pathways for Progress
  World Economic Forum
  http://goo.gl/kMxN99

› UNICEF 2014 Innovation Report
  http://goo.gl/5cc40u

› UN Data Revolution Advisory Group
  http://goo.gl/9T0jVm

› Using Mobile Data for Development
  Bill and Melinda Gates Foundation
  http://goo.gl/I5pdJg

› A World That Counts: Mobilising the Data Revolution for Sustainable Development
  http://goo.gl/OL73uZ

› Big Data for Development: A Primer
  UN Global Pulse
  http://goo.gl/zMzu0T

› New Data for Understanding the Human Condition: International Perspectives
  http://goo.gl/9Yki7s

USE OPEN DATA, OPEN STANDARDS, OPEN SOURCE, AND OPEN INNOVATION

Too often in international development, scarce, public resources are spent investing in code, tools, and innovations that are either locked away behind proprietary, fee-based firewalls, or created in a bespoke way for use in sector-specific silos. Principle #6: Use Open Data, Open Standards, Open Source, and Open Innovation provides a framework to consider an "open" approach to technology-enabled international development.

WHAT IT MEANS

› Adopt and expand existing open standards.

› Open data and functionalities and expose them in documented APIs (Application Programming Interfaces) where use by a larger community is possible.

› Invest in software as a public good.

› Develop software to be open source by default with the code made available in public repositories and supported through developer communities.

ABOUT THE PRINCIPLES

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CASE STUDY

A well-functioning supply chain is critical to the delivery of vaccines and other medical supplies. Where supply chains are broken or where inadequate information distorts a clear picture of health needs and medical supply availability, the result can be stock-outs of essential medicines and death due to preventable causes. Open Logistics Management Information System (OpenLMIS) is an effort to improve health systems through the creation of a shared platform of health supply chain tools and knowledge. It seeks to address the whole of the supply chain, rather than isolated efforts that address only a particular disease or supply chain layer. Built using open source software, OpenLMIS supports shared investment in and benefits from a system that is interoperable with other medical information systems, while being customizable to the unique needs of specific countries and projects. It is currently being used in Mozambique, Tanzania, Zambia, and Benin.

COMMUNITY INSIGHTS

OPEN INNOVATION

❯ Participate in "open" communities—such as code sprints, hackathons, meet-ups, and working groups—to encourage a free flow of ideas that permeate organizational boundaries.

❯ Contribute to building a culture of being "open" by encouraging training and knowledge development about how to leverage open resources within your organization.

❯ Consider investments in open data, open standards, and open software as an investment in a public good by enabling code and tools to benefit the wider community.

OPEN DATA

❯ Treat open data as the norm: it results in better services, innovation, and economic growth.

❯ Treat open data as a resource that can increase value to your organization, to the communities where you work, and to the broader public commons.

❯ Consider how data generated by your project can be shared publicly; in the case of data collected with funding from USAID, it is now required that the data be shared.

❯ Engage with counterparts in the national government to understand and contribute to emerging open data strategies, and to support a culture of data collection and use.

❯ Protect individuals' privacy and data security by using layers of access between public (non-sensitive) and private (sensitive).

❯ Use an open license to qualify how the data can be used, such as following the guidance available at www.opendatacommons.org/guide.

OPEN STANDARDS

❯ Understand how to apply standards—including both terminology (a set of common terms with standardized definitions), and interoperability (a set of formats determining how information is shared.)

❯ Use open standards to promote interoperability and open access, improving accessibility to information when it is "pulled" by users.

❯ Ensure there is clear buy-in and mandate from the government, including demonstrating efficiencies created through data exchange and interoperability of systems while avoiding vendor or software lock-in.

❯ Align incentives among all stakeholders through use cases that provide evidence of broad utility of data collected and shared. Include producers and consumers of data to raise awareness of mutual interests.

❯ Address privacy and security by using standards to dictate what information is exposed, and an interoperability layer to control what information is public or private, and who has access.

❯ Consider non-technical inputs, such as ensuring there is a strong community behind the standards, and a strong governance model guiding the use of standards. The technology is the easy part.

OPEN SOURCE

❯ Make an informed decision about whether to use open source, considering factors such as cost, community, standards, stakeholder ownership, and buy-in.

❯ Consider cost: the "free" in free and open source software (FOSS) does not mean the long-term use of a tool is without cost.

❯ Ask: Is it community-supported? Open source is typically only as strong as the community around it. This includes the staff within your organization managing projects built on the code, the developer community, and other external stakeholders.

❯ If open source is determined to be a suitable option, determine whether there is an existing open source solution to contribute to, and ensure there is alignment with your project's long-term goal, as well as clarity on the technical specifications required to guide open source code adaptation.

❯ Consider hybrid models: Open source does not mean non-profit—proprietary products can be built using open source software, open data, and open standards. Consider engaging consultants or private sector groups, particularly those with local experience and knowledge, to adapt and maintain the code.

RESOURCES

❯ Open Source Initiative
http://opensource.org/

❯ Open Logistics Management Information Systems
http://openlmis.org/

❯ Open Health Information Exchange
https://ohie.org/

❯ Open Government Partnership
http://www.opengovpartnership.org/

❯ International Aid Transparency Initiative
http://www.aidtransparency.net/

❯ World Bank Open Data
http://data.worldbank.org/

❯ USAID Development Data Library
http://www.usaid.gov/data

REUSE AND IMPROVE

As the use of information and communications technologies in international development has matured, so too has a base of methods, standards, software, platforms, and other technology tools. Yet too often we see scarce resources being invested to develop new tools when instead existing tools could be adapted and improved. Principle 7: Reuse and Improve highlights ways that adaptation and improvement can lead to higher quality resources available to the wider community of international development practitioners.

ABOUT THE PRINCIPLES

As the international development community matures in its use of information and communications technologies (ICT), many hard lessons have been learned. The Principles for Digital Development are "living" guidelines, designed to be updated and refined over time, which can help international development practitioners integrate established best practices into technology-enabled programs. This document is one of a series taking a closer look at each Principle. For more information visit **digitalprinciples.org**.

WHAT IT MEANS

› Use, modify, and extend existing tools, platforms, and frameworks when possible.

› Develop in modular ways favoring approaches that are interoperable over those that are monolithic by design.

CASE STUDY

Targeted social mobilization among at-risk communities played an important role in bending the curve of new Ebola cases in West Africa. The Ebola Community Action Platform (ECAP), developed by Mercy Corps and Population Services International (PSI) with contributions from over 70 mostly domestic partner organizations, aggregated and visualized data from over 800 social mobilizers who surveyed more than 2 million people. ECAP provided broad, public visibility into community activity, knowledge, and perceptions regarding Ebola. A number of ECAP social mobilizers used smart phones loaded with a Open Data Kit (ODK) Collect software tool. ODK is an adaptation of Java Rosa, a software tool developed to collect health data via mobile devices. Reusing ODK made sense for ECAP because: ODK is modular, meaning other tools can be integrated into its tool suite; data collected through ODK can be uploaded to and stored in any server environment; and the source code is entirely open, meaning that anyone can adapt it to meet new needs. ECAP used a paid, commercial service provided by Ona to improve on ODK's off-the-shelf offerings by hosting and visualizing the data, and providing professional support.

COMMUNITY INSIGHTS

- Consider how the reuse and improvement of existing tools, processes, and policies can in itself be a form of innovation.

- 'Reuse' implies taking the time to assess what resources are currently available and what modifications would be necessary; 'improvement' suggests doing these things and then making modifications to adapt existing tools to specific program or project needs, thereby improving the quality of tools available to the commons.

REUSE

- To determine whether reuse makes sense, ask questions like: does it meet stakeholder needs? Is it practical, modular, and extendable?

- Simply reusing may not always be the best thing to do. Improve as a condition of reuse, and be open to work out whether it's the right way to go.

- In reusing existing tools make your competitive advantage how you curate, manage, and implement the tool in the context of your project or program.

- Use resources like Kopernik's Impact Tracker (see Resources section below) for an overview of some existing digital tools.

IMPROVE

- Seek input from and co-create with end users to ensure improvements meet their requirements and specifications.

- Balance user experience specifications with what's viable from a business perspective, and feasible from technology perspective.

- Consider other factors influencing the design of improvements, such as inputs necessary to ensure local ownership, sustainability, and 'replicability.'

- Use rapid prototyping to continue testing and refining with end users; be prepared to be constantly learning.

- Build in dynamism to enable improvements to continue to be made over time. Embrace the notion that "nothing is complete."

- Consider whether improvements require localization, such as with content repositories.

- Ask what can you learn from outside your sector: for example, what are the similarities between an emergency room and a pit crew?

- Does your organizational culture embrace open source sharing? Consider how other sectors have benefitted from the rise of the sharing economy.

- Where it makes sense, demonstrate the business case of reuse and improvement—both within your organization and to donors and partners—including value to end user, and cost efficiencies versus building a new system.

- Advocate for shared services across sectors rather than building bespoke tools.

- Point to use of standards to shift the conversation from replacing X system to making X system standards compliant.

- Think about reuse across the value chain, such as in distribution channels.

- Contribute to a cycle of improvements: benefit from past work, improve the product and the education path, and then contribute back to the commons.

- Recognize that contributing back to the commons requires investment— e.g., improvements may need to be documented and packaged for reuse beyond your project.

RESOURCES

- Open Source Initiative
  http://opensource.org/

- Kopernik – Impact Tracker for Digital Data Collection Tools
  http://goo.gl/OYfBqM

- Kopernik – Impact Tracker for SMS Communications Platforms
  http://goo.gl/u62DNv

- Kopernik – Impact Tracker for Geospatial Mapping Tools
  http://goo.gl/DU2mEa

- Kopernik – Impact Tracker for Remote Sensors
  http://goo.gl/hi21Ll

> "We need to shift how we think of innovation, moving away from innovation as 'shiny object' toward innovation as smart use of scare resources."
>
> *—Merrick Schaefer, USAID*

ADDRESS PRIVACY & SECURITY

Information is power, as the old adage goes, and this is certainly true in the context of technology-enabled global development interventions. How information is collected, stored, analyzed, shared, and used has serious implications for both the populations about whom data are being transmitted, and the organizations transmitting the data. Principle 8: Address Privacy & Security provides a framework for considering how to protect user privacy and the security of data, devices, and tools.

WHAT IT IS

> Assess and mitigate risks to the security of users and their data.

> Consider the context and needs for privacy of personally identifiable information when designing solutions and mitigate accordingly.

> Ensure equity and fairness in co-creation, and protect the best interests of the end-users.

ABOUT THE PRINCIPLES

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CASE STUDY

In areas experiencing conflict or recovering from natural disaster, the delivery of commodities like food and medicine is an essential part of humanitarian aid. Yet in war-torn countries like Syria, security concerns can dictate that international NGOs rely on local partners to move supplies from border points to their final destination.

To enable the remote tracking of humanitarian aid packages being transferred during Syria's ongoing civil conflict, in 2012 the International Rescue Committee partnered with

SoukTel to develop the digital Commodity Tracking System (CTS) software. Billed by Wired as "a FedEx-style system for humanitarian aid," CTS pairs a data collection application for Android devices with a server-hosted package tracking system.

Before designing CTS, the International Rescue Committee conducted a risk assessment to ensure the safety of partners and people working in Syria. The resulting data privacy measures ensure that no personally identifiable information is captured. Packages are tracked using

a unique Quick Response "QR" code, and once packages are scanned the resulting data is encrypted, securely uploaded to cloud-based servers, and deleted from the partner's mobile device. Instead of using personal SIM data, CTS assigns abstract device IDs that link a device to a partner or individual user. CTS is an open source customization of the ODK Collect software that is now being maintained by the North Carolina-based Caktus Group. Find the CTS code base and linked documentation on GitHub at **https://github.com/theirc/CTS/**.

COMMUNITY INSIGHTS

›   Technology confers access to information, and access to information confers power. Privacy needs to become an inseparable part of all tech-supported development.

›   By generating data about individuals' identities, behaviors, activities, and locations, technology opens the door for unintended and unanticipated outcomes that can lead to significant risks, particularly for the most vulnerable populations.

›   Beyond keeping user's personal information private, and data that is collected secure, addressing privacy and security is about respect for and protection of the individual producers of data, and preserving their fundamental human rights.

›   The integration of digital tools into international development is requiring new principles, policies, and practices with regard to data privacy and protection. This is particularly true in an era of big data.

›   Think about privacy and security from the beginning and embed it into project and program design. Any checklist or set of best practices is just the start; protecting privacy and security requires expert guidance and meaningful implementation.

›   Identify a point of contact within your organization who can discuss how your organization handles privacy and security, and answer data producers' questions.

›   Create a governance structure that deals with accountability and enforcement

›   Ensure staff have guidance and support, and that privacy and security guidelines are understandable and usable by staff and contractors.

PRIVACY

›   Privacy concerns how we control access to personal information/data, including the extent, circumstances, and effects of sharing.

›   Even anonymized and aggregated information can lead to individual re-identification.

›   Some basic principles of privacy: Be proactive, not reactive; treat protection of personal data as a default setting; embed privacy into design; offer end-to-end security for personal data; be transparent about how data is collected and used; be responsive to concerns and queries; ensure data accuracy and confidentiality.

›   Ensure that personal data is being used for a specific, fair, and justified purpose. Consider that data use should be necessary and proportionate to the identified and consented to purpose

›   Consent should be obtained whenever personal data are gathered, and careful consideration should be given to data reuse.

›   Consider consent versus understanding versus choice. People can be overwhelmed by information. Even where people understand, sometimes consent is not choice unless there are meaningful alternatives.

›   Transparency should be an ongoing commitment. Transparent policies with a description of data processing flows should be one of the first steps. Individuals should receive regular notice about when and how their personal data are being used, who their data are being shared with, and who has requested their data.

›   When defining control and use of data, organizations should consider the principle of minimization, which says data processors should collect only essential data, keep data for the minimum possible time, and destroy the data when they are no longer needed.

SECURITY

›   Information security is about controlling who has access to data and under what circumstances. Measures can include checklists, technical tools like encryption, and policies governing authorized users who can validate and access information.

›   Know all the touchpoints and organizations that will handle data apart from your own. Consider privacy and security in the transfer of data, particularly across international borders, as well as in the outsourcing and subcontracting of data.

›   Consider that the use of shortcodes and SMS often mean that any information shared over mobile telecommunication channels may be shared with or accessed by other parties, such as third party aggregators, marketing companies, or government agencies.

›   Include security requirements with functional requirements, such as use of: initial configuration where default settings may not be sufficient; security testing, updates, and maintenance; minimally privileged accounts; strong passwords; and validation of all user-provided inputs.

›   Recognize that there is still a gap between available technologies and best practice, such as the lack of standards and methodologies for the use of anonymized data.

›   The move to the cloud will further complicate some of the issues. There is not yet a universally binding resolution covering all countries in the context of cloud computing.

›   Balance privacy and security measures with expected risks and benefits. Aim to support both the analytical benefits of data with protection of producers of those data.

RESOURCES

›   OECD Privacy Principles
    http://goo.gl/bfbe5t

›   EU Protection of Personal Data Principles
    http://goo.gl/uC8Rbp

›   Privacy by Design
    https://goo.gl/vvF4Px

›   UN Global Pulse Privacy and Data Protection Principles
    http://goo.gl/9IYkR6

›   Responsible Data Forum
    https://goo.gl/w2WCv0

›   ICRC Professional Standards for Protection Work
    https://goo.gl/sWKHNS

›   UN General Assembly Guidelines for the Regulation of Computerized Personal Data Files
    http://goo.gl/fXp1AH

›   International Standards on the Protection
    of Personal Data and Privacy
    http://goo.gl/O7JbkC

BE COLLABORATIVE

"If you want to go fast, go alone. If you want to go far, go together." This African proverb should be a mantra for technology-enabled development projects, yet to date, examples of successful and sustainable collaborative efforts are few and far between. Principle 9: Be Collaborative provides insights into leveraging and contributing to a broader commons of resources, action, and knowledge to extend the impact of development interventions.

WHAT IT MEANS

› Engage diverse expertise across disciplines and industries at all stages.

› Work across sector silos to create coordinated and more holistic approaches.

› Document work, results, processes and best practices and share them widely.

› Publish materials under a Creative Commons license by default, with strong rationale if another licensing approach is taken.

CASE STUDY

Recognizing that development outcomes are complex, and that current models are not sustainable, a group of nongovernmental, foundations, and consulting firms have created the Locus Initiative to drive the adoption of local solutions and more integrated development practices. Through shared research, pilot projects, global forums, academic courses, and a virtual knowledge hub, an initial group of seven Locus partners are working to support increased local ownership of project design and implementation; cross-sector integration in the development and implementation of programs; and sharing of measurement and evaluation frameworks and outcomes to better understand what works.

COMMUNITY INSIGHTS

› Competition can be both a barrier to and a catalyst for collaboration.

› Managing competition toward collaboration requires sufficient investment in supporting people, processes, and policies.

› More well-tested tools and strategies are needed to supplement the high-level guidance and anecdotes that are the most common sources of good practice on collaboration in tech-supported development work.

› Collaboration can take a variety of formats, from defaulting to open standards, data, and platforms, to engaging in partnerships within a sector or across sectors.

IDENTIFY COMMON BARRIERS

› Collaboration requires identifying and overcoming a variety of potential barriers, including conflicting financial incentives, organizational constraints, and engrained practice.

› Collaboration requires time and trust, two valuable commodities that are difficult to build into programs with short funding cycles.

› U.S. government (USG) funding allocated by Congress is assigned earmarks that constrain how money can be spent. This becomes a major determinant of USG-funded development program design.

› The Inspector General and auditors of USG funding expenditures currently measure against proposals submitted before program activity is underway, making the adaptations that are frequently required of collaborative efforts difficult.

› Collaboration must overcome barriers posed by the current design of the international development system, which is organized in silos.

› Among donor and host governments and development practitioner organizations, few have dedicated offices, staff, or policies focused on integration.

BUILD TOWARD COLLABORATION

› At the individual level, join the Principles for Digital Development Working Group; at an organizational level, endorse the Principles.

› Leverage and contribute to the growing culture of open approaches to development, such as through the broad use of Creative Commons licensing.

› Track and share work processes with a view toward enabling long-term project ownership by local or other stakeholders.

› Share evaluation reports and lessons learned through formal channels like 3ie, and informal channels like Fail Faires or Fail Fests.

› Join networks of likeminded partners to build relationships, and to contribute to and benefit from public knowledge commons.

› Consider end users as key collaborators. Allow space and time to do deep assessments of end user needs, and design collaboratively with the user.

› Use RFPs as an opportunity to identify how your approach will benefit from and contribute to collaborative efforts, from open data to partnerships.

› Understand and address blockages within your organization that may hinder collaboration.

› Invest in the organizational structure, communications protocol, time, and staff training that enable effective collaboration.

› Articulate the business case for why information sharing and collaboration are useful, and write that into your project's DNA.

› Consider and address how lines of accountability may change in a collaboration.

› In partnerships, identify the incentives of each stakeholder, remembering that each actor likely has a different set of incentives, and all actors are driven by both market and social incentives.

› Make a personal commitment to being collaborative, especially where the international development architecture is not yet fully optimized for collaboration.

RESOURCES

› Digital Development Principles Working Group
http://goo.gl/zgorTD

› Locus Initiative
http://goo.gl/MNa5T4

› International Initiative for Impact Evaluation
http://goo.gl/wNIJPn

› Creative Commons
http://goo.gl/DVPLnR

› Fail Festivals
https://goo.gl/gL92nH

› DevEx Impact
http://goo.gl/6vDfko

› Scaling Up Public-Private Collective Impact for the SDGs
https://goo.gl/3pdtZX

› Doing Development Differently Manifesto
http://goo.gl/ihX8sf

› Agile Software Manifesto
http://goo.gl/yw14Ra