An Introduction to Digital Square Global Goods
“Governments around the world are embracing this new age of digital health transformation. Expectations are high as more governments look towards these new tools and the connections they create.”

Dr. Mpoki Ulisubisya, Permanent Secretary
Tanzania Ministry of Health, Community Development, Gender, Elderly and Children
OpenHIE Community Meeting, July 2018
Digital health promises a future with more responsive, participatory health care—but only for those who can access it.

Governments need quality, affordable digital health technologies that work for all communities.

The future of digital health relies on better alignment among country leaders, investors, and innovators.
Historically, digital health initiatives have addressed the health system through a narrow lens.

The proliferation of digital health stakeholders and projects has led to fragmentation, competing priorities, and additional burdens on the health system.
Digital Square was created to address the need for alignment and coordination in the digital health sector.

“Create funding mechanisms and models that enable co-funding and both build and sustain digital health commons.”

USAID—Fighting Ebola with Information, 2016

“Support interoperability of digital technologies for health by...the use of international and open standards as an affordable, effective and easily adaptable solution.”

WHO Resolution 2017–A71/A/CONF./1

“Transition investments towards global public goods that build national health systems.”

National Academies of Science, Engineering, and Medicine, May 2017

“Ecosystem collaboration is needed to address current fragmentation and create a holistic digital health model.”

GSMA—Scaling Digital Health in Developing Markets, June 2017
Digital Square has identified **three barriers** where it can have the most influence:

1. Inadequate alignment of actors pursuing the digital transformation of health, leading to large inefficiencies in digital health investments.

2. Inadequate investment into scaling digital health innovations beyond the pilot stage, and maturing them into global goods, resulting in loss of trust from countries when pilots are unable to replicate small-scale successes at scale.

3. Country health leader demands for information, knowledge, and skills are not being met, and information asymmetries lead to misalignment around national digital health strategies.
Vision
A world where appropriate use of digitally enabled health services closes the health equity gap.

Mission
Connect health leaders with the resources necessary for digital transformation
Digital Square addresses the need for a thriving marketplace for digital health.

Alignment & Co-investment

Global Goods

Regional & Country Systems
Alignment & Co-Investment
Digital Square:

- Supports a shared vision.
- Grows the overall digital health sector.
- Provides an agile procurement vehicle.
- De-risks investment into digital health by making high-impact opportunities visible.
Flagship initiative: Assessing how digital health maturity varies throughout the world

For more information: https://digitalsquare.org/blog/2019/12/6/how-digital-health-maturity-can-inform-global-goods-design
Flagship initiative: Assessing how digital health maturity varies throughout the world

For more information: https://digitalsquare.org/blog/2019/12/6/how-digital-health-maturity-can-inform-global-goods-design
Flagship initiative: Digital health market analytics can build alignment on what’s important at different levels of maturity

<table>
<thead>
<tr>
<th>Level 1 (Least mature countries)</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5 (Most mature countries)</th>
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<tbody>
<tr>
<td>Offline functionality</td>
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<td>HIPAA/GDPR</td>
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<td>Small data packets</td>
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<td>Health insurance workflows</td>
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<td>SMS inputs</td>
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<td>Artificial intelligence / machine learning*</td>
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<td>High number records allowable</td>
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<td>Automation*</td>
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Source: Preliminary findings from qualitative interviews across open source product proprietary product providers, and country stakeholders; currently being validated through quantitative analytics
Global Goods
Digital Square:

- Allocates global good investments transparently and with community input.
- Provides rigorous yet pragmatic technical oversight on investments.
- Connects the global good community to each other and to country efforts.
- Secures investment for core software development.
Global goods are digital health tools that are adaptable to different countries and contexts. There are three types of global goods:

**Software**
A software tool that is (frequently) free, open source, and used to manage, analyze, or transmit health-related data, with proven utility in several settings.

**Services**
A software tool that is used to manage, transmit, or analyze health-related data that can be freely accessed as a software service and adheres to open data principles.

**Content**
A resource, toolkit, or data standard that is available under an open license and that is used to improve or analyze health data management processes.

For more information: [https://wiki.digitalsquare.io/index.php/Main_Page](https://wiki.digitalsquare.io/index.php/Main_Page)
Specific examples of global goods

Open source, web-based Health Management Information System (HMIS) platform. Since DHIS2’s release in 2006, nongovernmental organizations (NGOs) and national governments have deployed DHIS2 for health-related projects, including monitoring patient health, improving disease surveillance and pinpointing outbreaks, and speeding up health data access.

Open source, cloud-based electronic logistics management information system (LMIS) purpose-built to manage health commodity supply chains.

Software platform and a reference application which enables design of a customized medical records system with no programming knowledge.

Mobile data collection tools for resource-limited settings

For more information: https://digitalsquare.org/resourcesrepository/global-goods-guidebook
Global Good Maturity Model

Software Maturity
- Security
- Scalability
- Software productization
- Technical documentation
- Interoperability and data accessibility

Global Utility
- Country utilization
- Country strategy
- Digital health interventions
- Source code accessibility
- Funding and revenue

Community Support
- Community engagement
- Community governance
- Software roadmap
- User documentation
- Multilingual support

Digital Square | connecting the world for better health
Global utility/Country utilization: Preliminary market penetration analysis of 10 Digital Square global goods
<table>
<thead>
<tr>
<th>Public Health Disease Surveillance System</th>
<th>Electronic Medical Records</th>
<th>Laboratory Diagnostics Information System</th>
<th>Telemedicine</th>
<th>Data Interchange, Interoperability and Accessibility</th>
<th>Facility Management Information System</th>
<th>Research Information Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>SORMAS mHero*</td>
<td>Bahmni*</td>
<td>LIS COP*</td>
<td>Mobile WAcH</td>
<td>OpenHIE*</td>
<td>GOFR*</td>
<td>SORMAS mHero*</td>
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<tr>
<td>ODK-X REVEAL</td>
<td></td>
<td>OpenELIS*</td>
<td></td>
<td>OpenHIM*</td>
<td>Healthsites*</td>
<td>ODK-X REVEAL</td>
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<tr>
<th>Health Management Information System</th>
<th>Logistics Management Information System</th>
<th>Civil Registration and Vital Statistics</th>
<th>Clinical Terminology and Classifications</th>
<th>Community-based Information System</th>
<th>Geographic Information System</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHIS2*</td>
<td>OpenLMIS*</td>
<td>OpenCRVS*</td>
<td>Open Concept Lab*</td>
<td>CommCare*</td>
<td>Planwise</td>
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<tr>
<td>ODK-X</td>
<td>Logistimo*</td>
<td></td>
<td></td>
<td>Community Health Toolkit*</td>
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</tbody>
</table>

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<thead>
<tr>
<th>Health Finance and Insurance Information System</th>
<th>Human Resource Information System</th>
<th>Knowledge Management System</th>
<th>Pharmacy Information System</th>
<th>Shared Health Record and Health Info. Repositories</th>
<th>Learning and Training System</th>
</tr>
</thead>
<tbody>
<tr>
<td>OpenIMIS*</td>
<td>iHRIS*</td>
<td>Digital Health Atlas KM Library (using dspace)</td>
<td>Pharmadex</td>
<td>HAPI FHIR* HEARTH*</td>
<td>OpenDeliver</td>
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<td>PCMT*</td>
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**Legend**

<table>
<thead>
<tr>
<th>Bold</th>
<th>Funded</th>
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<tbody>
<tr>
<td>Italicized</td>
<td>Unfunded</td>
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</table>

* Aligned with OpenHIE
# Global Utility/DHI: Number of global good investment systems covering DHI Classification areas

<table>
<thead>
<tr>
<th>1.0 Clients</th>
<th>2.0 HealthCare Providers</th>
<th>3.0 Health System Managers</th>
<th>4.0 Data Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Targeted Client Communication (1)</td>
<td>2.1 Client identification and registration (10)</td>
<td>3.1 Human Resource Management (4)</td>
<td>4.1 Data Collection, Management and Use (9)</td>
</tr>
<tr>
<td>1.2 Untargeted Client Communication</td>
<td>2.2 Client Health Records (12)</td>
<td>3.2 Supply Chain Management (7)</td>
<td>4.2 Data Coding (1)</td>
</tr>
<tr>
<td>1.3 Client to Client Communication</td>
<td>2.3 Healthcare provider decision support (11)</td>
<td>3.3 Public Health Event Notification (2)</td>
<td>4.3 Location Mapping (6)</td>
</tr>
<tr>
<td>1.4 Personal Health Tracking</td>
<td>2.4 Telemedicine (4)</td>
<td>3.4 Civil Registration and Vital Statistics (1)</td>
<td>4.4 Data Exchange and Interoperability (4)</td>
</tr>
<tr>
<td>1.5 Citizen-based Reporting</td>
<td>2.5 Healthcare provider communication (7)</td>
<td>3.5 Health Financing (1)</td>
<td></td>
</tr>
<tr>
<td>1.6 On-demand information services to clients</td>
<td>2.6 Referral coordination (10)</td>
<td>3.6 Equipment and Asset Management (6)</td>
<td></td>
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<tr>
<td>1.7 Client financial transactions</td>
<td>2.7 Health worker activity planning &amp; scheduling (7)</td>
<td>3.7 Facility Management (6)</td>
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</tr>
<tr>
<td></td>
<td>2.8 Healthcare provider training (4)</td>
<td></td>
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<td></td>
<td>2.9 Prescription and medication management (3)</td>
<td></td>
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<tr>
<td></td>
<td>2.10 Laboratory and Imaging Management Diagnostics (5)</td>
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</tbody>
</table>

### Legend
- **Shaded (#):** Global goods supported by Digital Square (approved by Digital Square Board)
- **White:** Not currently supported by Digital Square
Software Maturity/Productization: Evolving to shelf readiness
Software Maturity/Productization: Shelf-ready requirements:

- Required score according to **Global Good Maturity Model**
- Supports standards for data exchange as appropriate
- Aligns with **DevOps & Cloud-Services** guidelines
- Aligns with **OpenHIE Architecture** (Instant OpenHIE)
- Prioritize those with entry in **Global Good Guidebook**
Software Maturity/Productization: Shelf ready requirements
Phase II

- Build off Phase I (productization) requirements

- Identify Functional Requirements for each of the “shelves” (business domain services, metatadata registries & interoperability layer, point of service systems)

- Example-EMRs and Digital Client Records should draw functional requirements from:
  - HL7 EMR Functional Requirements
  - Digital Accelerator Kits
  - OpenHIE identified workflows (e.g. Registration as a Service, Referrals)

- Example-Health Insurance should draw requirements from:
  - Joint Learning Network’s “Search Results Connecting Health Information Systems for Better Health”
  - OpenHIE Health Financing community identified workflows
Periodically, Digital Square holds a “open call for applications,” whereby organizations can submit concept notes for new global goods investments using an Open Application Process.

Open Application Process

- Open Submission of Concept Notes
- Proposal Co-creation & Collaborative Feedback
- Final Proposal & Budget Submission
- Vetted by Peer Review Committee
- Funding Decisions by Board
<table>
<thead>
<tr>
<th><strong>COVID-19: Select overview of identified needs for digital systems</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regional/Global</strong></td>
</tr>
<tr>
<td>Inputs to WHO SitRep</td>
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<tr>
<td>Regional Case Reporting &amp; Surveillance</td>
</tr>
<tr>
<td>Cross-Border Contact Tracing</td>
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<tr>
<td>Push out new policies and guidance</td>
</tr>
<tr>
<td><strong>National/ MOH</strong></td>
</tr>
<tr>
<td>Dashboards for Emergency Operations Centers</td>
</tr>
<tr>
<td>Lab Results &amp; Specimen Transport</td>
</tr>
<tr>
<td><strong>Sub-national</strong></td>
</tr>
<tr>
<td>Dashboards for Surveillance Officers</td>
</tr>
<tr>
<td>HW Comms &amp; Coordination</td>
</tr>
<tr>
<td>Distribution PPEs and Reagents</td>
</tr>
<tr>
<td>Remote Training</td>
</tr>
<tr>
<td><strong>Health facility/ Community</strong></td>
</tr>
<tr>
<td>Data-driven action lists (e.g. contact tracing, case reporting)</td>
</tr>
<tr>
<td>Stock levels PPEs and Reagents</td>
</tr>
</tbody>
</table>
COVID19: Liberia’s electronic integrated disease surveillance & response system(s)

eIDSR Overview

- Digital Square connecting the world for better health
Global Good Adaptation

• Ready-to-install DHIS2 digital data packages to support COVID-19 surveillance & response based on WHO guidelines. Optimized for Android or web-based data collection.
• 1) case-based surveillance to track a case through clinical examination, exposures, initiate lab requests, record lab results and case outcome; 2) contact tracing program to facilitate operations of contact tracing and with built in relationships to the case-based tracker for enhanced analysis; 3) automated analysis of core indicators & dashboards for response planning.

OpenLMIS

• OpenLMIS is responding by supporting OpenLMIS countries to optimize their use of the software to encourage good supply chain management of COVID supplies. We are currently conducting country outreach to ensure users know how to quickly:
  • Add new Products
  • Initiate emergency requisitions
  • Configure and manage inventory of Kits (anticipating the need for COVID kits)

OpenMRS

The following OpenMRS COVID-19 Public Health Response Tools under development and discussion include:
• CIEL concept dictionary with COVID-19 concepts
• COVID-19 Public Health Response Module
• COVID-19 Public Health Reporting System Interfaces

• Standard content related to COVID-19 included in the recent release of Reference Application 2.10.0.

ODK

• ODK’s lead developer, Nafundi, is offering pro-bono help to anyone working on the COVID-19 response.
• Rapidly digitizing forms from the WHO and CDC protocols and making them available for others to use and build on.
• Offering support for ODK for contact tracing, decision support, community education, strategic mapping, and case management.

OpenHIE COVID-19 Task Force (Cross-cutting for all global goods)

• Identify and collate information relating to data standards and exchange relevant to the COVID-19 response.
• Identify gaps in and establish standards for data exchange priorities.
• Provide documentation and guidance (to both the global good community as well as proprietary software tools) to improve adherence to these standards.
• Ensure that rapidly deployed solutions can be integrated into the national digital health architectures.

• Outputs: HL7 FHIR profile / implementation guide for case reporting & contact tracing.

Regional & Country Systems
Digital Square:

- Coordinates resources and expertise from multiple investors to support country and regional digital health initiatives.
- Supports the professional development of local global good entrepreneurs and link them to the global good community.
As of 5/1/20, Digital Square has catalyzed $48,672,715

<table>
<thead>
<tr>
<th>Investors</th>
<th>Co-investors</th>
<th>Global Goods</th>
<th>Country Buy-ins</th>
<th>Partners</th>
<th>DH&amp;I WG Members</th>
<th>Invested in Global Goods</th>
<th>Regional Networks</th>
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<tbody>
<tr>
<td>13</td>
<td>2</td>
<td>26</td>
<td>4</td>
<td>40+</td>
<td>250+</td>
<td>$12m</td>
<td>4</td>
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Digital Square | connecting the world for better health
Appendix
Alignment among digital health actors can catalyze digital transformation. Digital transformation can strengthen the health system by improving the data use cycle and empowering target users... which can accelerate outcomes at all levels to drive toward high-quality health care and health impact.

**Digital Square areas of focus**

- **Investors**
  - align and coordinate resources towards a ground-up approach

- **Global goods innovators**
  - mature their global goods, which add value to holistic country architectures

- **Decision-makers**
  - have the skills, ability, motivation, and information to influence global approaches and adapt them to local context

- **Communities & health workers**
  - have the skills, ability, motivation, and information to inform ground-up approaches and provide health services

- **Global policymakers**
  - develop evidence-driven standards; own, diffuse, and adapt guidance; endorse and influence curricula

- **Foundational elements**
  - National health strategy / plan
  - National digital health landscape and strategy
  - Principles for Digital Development
  - Principles of Donor Alignment
  - WHO Classification of Digital Health Interventions
  - Data governance and responsible data use
  - Health equity (including gender) considerations

**Core health system functions**

- Human resources for health
- Health finance
- Health governance
- Health information
- Medical products, vaccines, and technology
- Service delivery
- Data production, knowledge flows, and exchange
- Data use cycle

**Behavior change at all levels**

- Citizens / communities can access information and services to manage their health
- Health providers are accessible and have information to provide high quality care
- Health system managers match available resources to needs so that resources are available at the point of care

**Deliver high-quality health care that is**

- Accountable
- Affordable
- Accessible
- Reliable

**HEALTH IMPACT**

Information use for management, planning, budgeting & delivering services

**Contextual factors:** health equity (including gender), global initiatives, civil/political unrest, disease outbreaks, socioeconomic status, natural disasters, privatization, decentralization, etc.
### Alignment & Co-Investment: Success

<table>
<thead>
<tr>
<th>2020 Target</th>
<th>2020 Stretch Goal</th>
<th>Long-term goal</th>
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</thead>
</table>
| • Increased alignment on:  
  • WHO and Digital Square strategies  
  • Country leadership  
  • The role of digital in COVID-19 response and in provision of essential services  
  • Two new investors and two renewing investors  
  • $15M in financing secured. | • Increased alignment on:  
  • Theory of Change  
  • Curriculum harmonization  
  • Value of market analytics  
  • Double number of investors coordinate and align with Digital Square compared to 2019.  
  • $30M in financing secured. | • Increased alignment on how to create a self-sustaining market for digital health interventions in low-resource settings.  
 • 75% of signatories to the Donor Alignment Principles invest in Digital Square.  
 • $1B secured for entire sector, with ~$200M/year running through Digital Square. |

**Priority learning questions:**
- How much financial capital is needed to support a thriving digital ecosystem?
- Where does this capital come from? Does the private sector contribute at all?
- What successfully incets coordination and alignment?
## Global Goods: Success

<table>
<thead>
<tr>
<th>2020 Target</th>
<th>2020 Stretch Goal</th>
<th>Long-term goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 90% of WHO intervention categories have at least one global good.</td>
<td>• 100% of WHO intervention categories have at least one global good.</td>
<td>• 100% of WHO intervention categories have at least two global goods.</td>
</tr>
<tr>
<td>• 45 countries are using at least two global goods.</td>
<td>• 60 countries are using at least two global goods.</td>
<td>• 96 countries are using at least two global goods.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A network of entrepreneurs using global goods to build thriving local businesses.</td>
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</table>

**Priority learning questions:**

- What accelerates the adoption of global goods?
- How does Digital Square successfully and appropriately signal promising private sector products?
- Should Digital Square be thinking about data global goods as part of the continuum?
Regional & Country Systems: Success

<table>
<thead>
<tr>
<th>2020 Target</th>
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<th>Long-term goal</th>
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</thead>
<tbody>
<tr>
<td>• Currently supported initiatives have greater impact.</td>
<td>• Four new direct country partners.</td>
<td>• A thriving Digital &amp; Data Leadership program for health leaders and technocrats.</td>
</tr>
<tr>
<td>• 50% of individuals participating in initiatives can describe three or more examples of increased learning, sharing, or technical capacity.</td>
<td>• Launch of the Digital Health Applied Leadership Program.</td>
<td>• A network of entrepreneurs using global goods to build thriving local businesses.</td>
</tr>
<tr>
<td></td>
<td>• 80% of individuals participating in initiatives can describe three or more examples of increased learning, sharing, or technical capacity.</td>
<td>• 90% of individuals participating in initiatives can describe three or more examples of increased learning, sharing, or technical capacity.</td>
</tr>
</tbody>
</table>

Priority learning questions:

• Is our current engagement with country health leaders adequate to ensure their needs are met by the global goods under development?
• Should more effort be focused on bridging the gap in understanding between technologists and health professionals?
• Does Digital Square have a unique value to add by directly supporting country governments on the digital transformation of health systems?
Digital Square leverages PATH’s globally-based staff and activities in resourcing country and regional work.
Through a USAID buy-in mechanism, ministries of health can request technical and operational support with the guidance of USAID, including:

- Procurement, assessment, and **design of digital health implementations.**
- Development and implementation of national digital health **strategies, spend plans, and road maps.**
- **Creation of governance** and policy frameworks for digital health implementations.
- Design of **interoperable digital health architecture** across programmatic areas.
- **Harmonization of digital health implementation plans** across multiple projects.
- **Landscape analysis and inventory** of existing digital health tools.
- **Integration** of existing information systems.
- **Customization** of common digital health tools (e.g., DHIS2).