Digital Square Capabilities

COVID-19

Updated July 2021

Introduction

Digital Square is a PATH-hosted initiative that connects health leaders with the resources necessary for digital transformation. This initiative brings partners together to improve how the global community designs, uses, and pays for digital health tools and approaches. By strengthening coordination within the global community, Digital Square reorients the market to better match tools and approaches to the needs of countries and communities. Read more about Digital Square's strategy here.

Since the beginning of the COVID-19 pandemic, Digital Square has been leveraging its unique role and strengths to support countries, donors, and partners to utilize existing digital tools in response efforts. Harnessing our technical expertise and existing relationships across the global digital health ecosystem, including our engagement and support to global goods, we have been at the forefront of how digital tools can be and are being used to support countries' as they navigate the complexities of the pandemic. We also have utilized PATH's work in global health security, malaria, primary health care, and the broader digital and data portfolio to more comprehensively support country partners in ensuring essential health services remain available.

Digital Square's response to COVID-19 continues to be shaped by three core lessons from the 2014 West Africa Ebola outbreak including:

- Advocating for and supporting country-level adaptation of existing tools and technologies.
- Leveraging investments made in software tools since 2014 that have created more robust options for countries.
- Ensuring investments contribute to long-term, ongoing strengthening of health systems.

Digital Square is able to build on this work to provide (1) coordination and alignment across the digital health sector; (2) support to global goods; and (3) direct country support and capacity strengthening.

Coordination and Alignment

DIGITAL SQUARE CAN SUPPORT GREATER COORDINATION AND ALIGNMENT BETWEEN DONORS, HOST COUNTRY INSTITUTIONS, PUBLIC SECTOR ORGANIZATIONS, AND/OR PRIVATE SECTOR PARTNERS AS DIGITAL HEALTH INNOVATIONS ARE ADOPTED, ADAPTED AND SCALED IN RESPONSE TO COVID-19.

Digital Square has been supporting coordination and collaboration with partners to increase visibility into how digital tools are being adapted to support country responses to COVID-19. Digital Square continues to foster this coordination among actors including increasing visibility into how global goods and other partners are deploying tools for COVID-19 response, as well as how countries are using these tools.

Map and Match:

Digital Square's Map and Match project aims to help countries, donors, implementers, and the global digital health community at large to leverage and adapt existing digital tools in response to the COVID-19 pandemic. Digital Square seeks to understand, on a country-by-country basis, the landscape of existing, adaptable software tools used at scale, and match those tools with potential use cases for COVID-19. The emphasis is that countries should use what they already have, especially in times of a crisis, and that many digital tools can easily be adapted and scaled, both in terms of scaling for more users and scaling for additional use cases. Information on how global goods are adapting their tools or technologies to address COVID-19 is being presented in several highly attended public webinars and is available on the Digital Square wiki.

The Map and Match project began in August 2020 and concluded in June 2021. Data has been collected through a variety of methods including literature reviews, surveys, key informant interviews, and data sharing with other projects conducting complementary assessments. For example, during the mapping process, Digital Square leveraged other USAID-funded investments (i.e., President's Malaria Initiative assessment, research on Electronic Immunization Registries deployed at scale).

Phase I of the project included a broad, global landscaping identifying tools through desk review and submission of documents from global digital health partners. This research identified thousands of tools across more than 130 countries. In Phase II of the project, Digital Square built on Phase I data, collecting country-specific information for 22 countries[1] to develop highly-visual country briefs.
These briefs identify which tools are currently in use in the country, which are already being used in the country's COVID-19 response, and where there are opportunities for quick

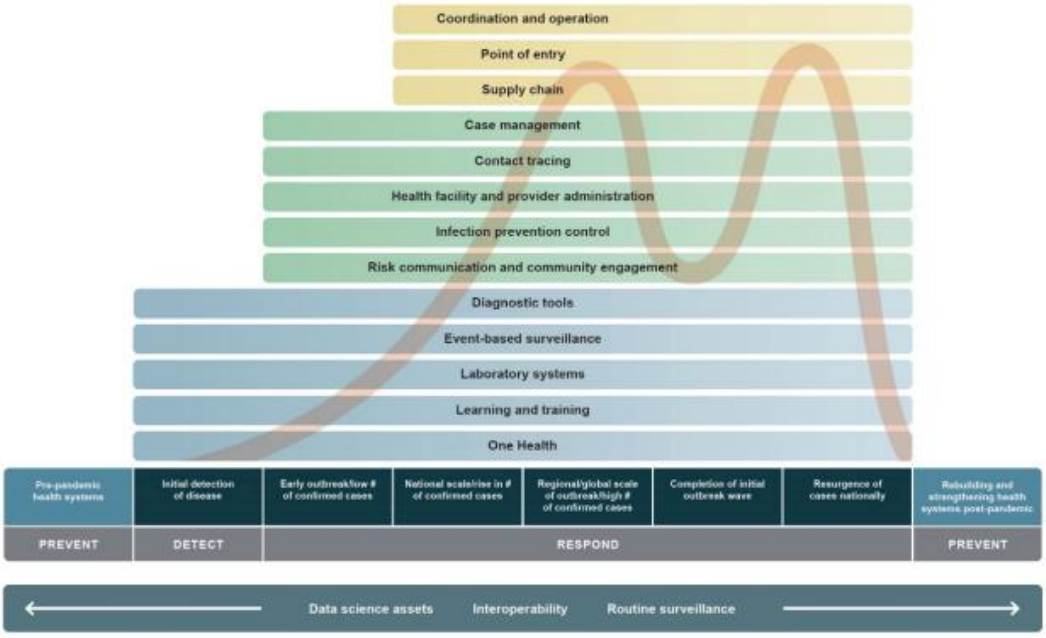
[1] Afghanistan, Angola, Bangladesh, Benin, Burkina Faso, Cameroon, Cote D'Ivoire, Ghana, Indonesia, Kenya, Malawi, Mozambique, Niger, Pakistan, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Uganda, Vietnam, and Zambia.

adaptation of existing tools across a number of use cases. Digital Square has coordinated closely with the WHO to share all data from Map and Match to the Digital Health Atlas. The full dataset for all Map and Match research is also available on our website, including data from both Phases and tools that were not included in the briefs that had no relevance to COVID-19 response.

Coordination and collaboration are at the core of the Map and Match Project. Early in the process, Digital Square convened investors to provide feedback on the process and share their efforts in supporting countries to use digital tools in the COVID response. Map and Match has brought together various donors including the United States Agency for International Development (USAID), WHO, German Agency for International Cooperation (GIZ), World Bank, United States Centers for Disease Control and Prevention (CDC), NORAD, UNICEF, Gavi, the Bill & Melinda Gates Foundation, and other partners. Digital Square's existing coordination and partnership with active partners in the COVID response illustrate our role in coordinating, aligning and convening partners in the digital health ecosystem.

Digital Applications and Tools Across an Epidemiological Curve:

The Digital Applications and Tools Across the Epidemiological Curve (DATEC), designed by Digital Square as part of the Map and Match project, is a strategic framework for governments, investors, implementing organizations, and the digital health community at large to better understand how existing digital tools can be adapted and used during different phases of an outbreak. The framework illustrates how existing digital technologies can be strategically leveraged to augment response during an epidemic and/or pandemic.



In addition to highlighting what digital tools and applications should ideally be in place for a strong health system before an outbreak, the DATEC helps visualize when and how tools can be most strategically used during different phases of an outbreak. It provides strategies to adapt digital tools after an outbreak to improve and strengthen health systems, and details the role data science and system interoperability play both during an outbreak as well as before an outbreak to ensure robust, adaptable systems are available during a crisis.

Combined with other Map and Match publications–such as a mapping of Digital Square global goods across use cases, the Global Goods Guidebook, and a framework for understanding scale–the DATEC is a resource for countries to deploy the right digital tools at the right time during a pandemic and can aid in planning the implementation of digital health systems outside of a pandemic.

Support to Global Goods

DIGITAL SQUARE IS SUPPORTING THE ADAPTATION, IMPLEMENTATION, AND SCALING OF DIGITAL HEALTH GLOBAL GOODS RELEVANT TO COVID-19 RESPONSE WITHIN COUNTRY HEALTH SYSTEMS.

Digital Square offers technical assistance to support global good partners. This includes support for technologies to customize their solutions including aligning solutions with global standards for data exchange, as well as support for deployment in countries where ministries of health have agreed to scale the tools.

Data Standards

Digital Square is co-leading the OpenHIE COVID-19 Task Force, which supports the collation of information relating to data standards and data exchange relevant to the pandemic response. The goal of this task force is to ensure that rapidly deployed solutions can be integrated into national digital health architectures and contribute to long-term health system improvements. Leading up to the formation of this group, Digital Square led the documentation of data models and standards used as part of the COVID-19 response, including international standards such as the International Classification of Diseases (ICD) and Health Level Seven Fast Healthcare Interoperability Resources (HL7 FHIR), and standards for global good tools such as DHIS2 Tracker, CommCare, and Surveillance Outbreak Response Management and Analysis System (SORMAS). The task force is focused on four key topics:

- Collating information relating to data standards and exchange relevant to the COVID-19 response.
- Identifying gaps in and establishing standards for data exchange priorities.
- Providing documentation and guidance, to both the global good community as well as owners of proprietary software tools, on adherence to these standards.
- Ensuring that rapidly deployed solutions can be integrated into the national digital health architectures.

In line with these activities, the Task Force has developed the FHIR implementation guide for COVID-19 case reporting as part of the public health response use case which contains the specifications developed by the OpenHIE community. The implementation guide, developed based on WHO guidelines, policies and recommendations, is intended to be supplemented by one or more content profiles guides developed for specific health program areas such as HIV, COVID-19.

The implementation guide defines three actors involved in the submission of a case report into a case report repository. These actors engage in the transactions to submit, transform and store case reports into a case report repository. Data from the case report repository can be extracted for use with existing national health systems. In addition to developing the vetted HL7 FHIR

implementation guide for case reporting and contact tracing, the Task Force aims to map data elements into a standard data dictionary format used by the WHO Accelerator Kits.

To support the adoption of the outputs from the OpenHIE COVID-19 Task Force, Digital Square is coordinating with organizations in the Digital Square Global Goods Community such as Jembi Health Systems and IntraHealth, on the application of the task force's outputs. Digital Square is also supporting resource identification for software updates and adaptations required to implement data and data exchange standards, as well as system maintenance as technologies are adapted and strengthened for the recovery phase.

Global Good Deployments

Digital Square promotes the development, adoption, and re-use of digital health global goods, increasing the availability, adaptability, and maturity of digital tools deployed. Approved Digital Square global goods are quickly adapting their software to add COVID-19 specific modules for case reporting, contact tracing, communication with frontline health workers, training and tools for health workers, supply chain management, facility mapping, and other use cases. Digital Square has provided support to the following global goods for COVID-related activities:

Bahmni:

Bahmni is an easy-to-use hospital information system and electronic medical record (EMR) system developed in the global south to meet the needs of low-resource environments. Bahmni is a distribution of the OpenMRS medical record platform, with a user interface built from the ground up.

To support its community of implementers, Bahmni has released a set of pre-configured templates that can be adopted by any implementer and used for COVID-19 contact tracing. The Bahmni deployment in Nepal was the first one to be adapted for COVID-19. Additionally, publicly available modules have been released to enhance Bahmni's existing capabilities.

The Bahmni Covid-19 Starter Kit enables healthcare practitioners using Bahmni to capture COVID-19 specific data and report disease statistics; the Bahmni Covid-19 Vaccine Kit enables the capture of vaccination details of patients being vaccinated. Implementers in the community have built a tele-consulting module using Bahmni's appointment scheduling feature to reduce the strain on health systems due to patient inflow while maintaining continuity of care during the pandemic.

CommCare

CommCare is an open source platform that has been used for COVID-19 response by more than 25,000 users across more than 30 countries since March 2020. Dimagi, a Digital Square partner and the organization that develops CommCare, designed and deployed a set of free, templatized CommCare applications and reporting options using mobile, web, and SMS. These applications have been applied to a wide variety for COVID-19 use cases, including community preparedness, contact tracing, facility readiness assessment, port of entry screening, and health worker education. Dimagi has also collaborated with other digital development organizations to

create a dedicated COVID-19 response team to provide hands-on support to many countries and large organizations to adapt and deploy CommCare applications for COVID-19 response.

Community Health Toolkit

Community Health Toolkit (CHT) is an open-source platform that supports health workers as they provide essential care in their communities. Built on open source technologies and open access design, it is quickly configurable to meet specific project needs. The collective works to support the development of digital health initiatives in the hardest-to-reach areas.

Solutions built on the CHT platform have been adapted to support reporting, verification, and escalation of potential COVID-19 cases for rapid response and data-driven decision-making such as mDharura in Kenya and MaliKaKeneya in Mali to screen suspected cases of COVID-19. Health workers use SMS to rapidly report suspected COVID-19 cases to their supervisors for verification. Supervisors and Sub-County Health Management Teams use the CHT app on Android devices to verify and investigate the reported cases and provide appropriate care, enabling data-driven decision-making and response at the national level. The system has been deployed to over 6000 users.

DHIS2 and Tracker

DHIS2 is currently being used to respond to COVID-19 in countries around the world, and has been evaluated as a leading digital solution for COVID-19 response by Johns Hopkins University, the CDC, and Digital Square. As a WHO Collaborating Centre, DHIS2 has developed toolkits to support COVID-19 surveillance and national vaccine delivery plans, used throughout Asia, Africa and Latin America. Installable metadata packages facilitate uptake of global data standards and best design practices in national Health Management Information Systems (HMIS), while enabling flexibility for localization and customization for country workflows. Accompanying technical guidance, implementation guides, demo databases and training materials provide all the resources a country needs to hit the ground running and implement fit-for-purpose solutions to curb the pandemic.

Successful instances of DHIS2 being used to curb the ongoing pandemic include the use of DHIS2 Android Capture App by Rwanda's Ministry of Health for a completely paperless sample collection and result distribution process; a COVID-19 surveillance system built by the Palestinian National Institute of Public Health, a project led by the World Health Organization in cooperation with the Norwegian Institute of Public Health, using local capacity to provide evidence-based public health knowledge to support policy formulation; an Immunization Registry combined with Stock Monitoring enabling analysis and monitoring for stakeholders at all levels of the health system in Sri Lanka.

mHero

IntraHealth International's mobile application, a 2-way communication system called mHero that allows ministries of health to communicate with health workers, rose out of the Ebola crisis and having been deployed at scale, contributed to ending the outbreak in Liberia. Today, it is being used in the fight against COVID-19 as a readily available tool that health workers have come to

trust and the MoH uses as a means to disseminate critical communication to frontline health workers. Messages sent via mHero have reached more than 20,000 health workers, providing them information related to COVID-19, including: infection prevention and control, contact tracing, home-based isolation care, risk communication, as well as stigma and psychosocial support. mHero has been used in Liberia and Kenya, and is currently being expanded in the Democratic Republic of the Congo.

Open Concept Lab

Open Concept Lab (OCL) is an open source terminology management system to help collaboratively manage, publish, and use metadata in the cloud alongside the global community. Imagine GitHub for indicators, terminology, and metadata—it serves as a one-stop shop to access international standards, create and publish definitions, or browse country and global indicators with mappings to the diagnoses, procedures, and other data definitions used to calculate them.

OpenELIS

Open Enterprise Laboratory Information System is a global open source software tailored for public health laboratories in resource-constrained settings to support best laboratory practices and accreditation. OpenELIS can work offline and is available in English and French. OpenELIS Global has added COVID-19 metadata to support laboratory systems. Users can immediately use the adaptations in the software to add tests for SARS-CoV-2 to their laboratory test catalog to facilitate tracking of laboratory tests and results.

OpenLMIS

Responding to the urgency necessitated by COVID-19, OpenLMIS has created a new, simplified configuration of OpenLMIS that can be quickly deployed for the integrated management of COVID-related supplies. The Logistics Management Information System (LMIS) is designed to be used at scale, by national governments and large NGOs to incorporate COVID-related supplies into their supply operations. With all the same features and functionality of OpenLMIS, the lighter version is packaged into a tool that is technically simpler, quicker to deploy, and designed specifically for COVID-related products. The tool enables supply orders to be placed from warehouses, and tracks the order until it is fulfilled and delivered. It also supports the tracking of consumption to inform future replenishments.

In Cameroon, the COVID-19 Edition of OpenLMIS has been deployed in 60 sites with more planned for roll-out. As a result, the supply chain is now well defined and enables requisitions and visibility into stock of COVID related commodities. The deployment is expected to eventually cater to 5,000 health facilities and more than 10,000 users with an estimated 50% reduction in stock out rates at deployed sites.

OpenLMIS' Cold Chain Equipment (CCE) Management module supports the creation of a central-level CCE catalog linking health facilities with associated equipment data, and through the Remote Temperature Monitoring functionality, generates alerts when devices are out of

recommended temperature range, prompting timely action to prevent wastage of vaccines. The CCE module is being used in Mozambique's EPI program and could also be deployed in countries' COVID-19 vaccine roll-out.

OpenMRS

With its mission to 'build the world's largest and most flexible technology platform to support delivery of health care', OpenMRS adaptations are being deployed for COVID-19 tracking. KenyaEMR, Kenya's medical record system, for example, is built on OpenMRS and combined with another global good, the Community Health Toolkit, enables case registration, contact tracing and COVID-19 laboratory orders.

An active COVID-19 Response Squad is working to identify existing work within the OpenMRS community that can be rapidly adapted by implementers and packaged as a suite of COVID-19 Public Health Response Tools, including a COVID-19 concept dictionary and a Public Health Reporting System. The COVID-19 Response Squad invites informatics experts, business analysts and implementers to join the conversation and contribute to its own efforts.

OpenSRP

Open Smart Register Platform (OpenSRP) is an open source mobile health platform to empower frontline health workers and simultaneously provide program managers and policymakers with current data for decision-making and policymaking through purpose-built applications. One such application is Reveal, an open source platform that utilizes aspects of spatial intelligence, including high resolution satellite imagery, machine learning risk models, as well as front-end mobile tools, to assist governments and implementing partners plan, guide, monitor and adjust health campaigns, ensuring services are delivered in the most efficient and effective way possible. To support Reveal's ability to get resources to vulnerable populations, adaptations have been made that include modified forms to incorporate COVID-related data and modifications to the planning module.

SORMAS

The Surveillance, Outbreak Response Management and Analysis System (SORMAS) aims to improve prevention and control of communicable diseases particularly in resource-poor settings. With the emergence of COVID-19, SORMAS has been adapted with a new module for detection and control of the coronavirus. The Nigeria Public Health Service is using SORMAS for epidemiological follow-up and containment. Other countries such as Nepal and Fiji Island are also preparing to deploy SORMAS in response to the COVID-19 outbreak.

Country Support and Capacity Strengthening

DIGITAL SQUARE WORKS WITH COUNTRY GOVERNMENTS TO STRENGTHEN LOCAL CAPACITY FOR DESIGN, IMPLEMENTATION, AND MANAGEMENT OF HEALTH SYSTEM-WIDE APPLICATIONS OF DIGITAL TOOLS AND TECHNOLOGIES.

Country Support

Digital Square is able to support the needs of countries as they emerge in the COVID-19 response, particularly for countries that have a standing relationship with Digital Square or the wider PATH portfolio. The following examples demonstrate how PATH is already engaged with country governments as they coordinate and use digital tools in their COVID-19 response.

Vietnam

In Vietnam, PATH supported the Ministry of Health to rapidly develop a digital surveillance system which captures patient level data including contact information, development of clinical signs, laboratory testing, hospital enrollment, treatment progress, and discharge. The system was stood up and deployed in nine days. PATH is supporting the Ministry's use of their data for decision making including planning the purchase of supplies (i.e. dialogic test kits) and predictive modeling for outbreak areas. In addition, PATH supported Viettel to develop an online declaration form at border/immigration gates that is linked with Vietnam's COVID-19 reporting system.

Senegal

PATH has developed a strong partnership and collaboration with the divisions and the directions of the Ministry of Health—specifically the Division of Health and Social Information Systems, the Direction of Prevention, and the Directorate of Laboratories and the EOC. In March 2020 as the COVID-19 pandemic gained speed, PATH's digital health experts in Senegal supported the Ministry of Health to adapt the Tracker in DHIS2 for the surveillance of COVID19 cases. The early adaptations for the Tracker included the enrollment and follow-up of suspected cases, capture of symptoms of suspected and confirmed clients, and use of the tool to strengthen the active case detection through contact tracing activities.

PATH's team worked with the MOH to train all districts in the use of the Tracker for COVID-19 case notification and supported post-training supervision visits. In addition to supporting Senegal's Emergency Operations Center and developing a COVID-19 tracker, PATH is engaged in multiple national technical working groups and providing feedback on national guidelines to maintain essential health services during COVID-19. PATH continues to provide ongoing support ongoing technical support for the implementation of DHIS2 COVID-19 Tracker and mentoring staff for the 20 most affected health districts.

Democratic Republic of the Congo

In the Democratic Republic of the Congo (DRC), PATH, through its Global Health Security Partnership portfolio provides technical and logistical support to the Ministry of Health as they develop a national response plan. The COVID-19 Presidential Task force is housed within the PATH DRC office, and builds from the support provided to the Emergency Operation Centers. The PATH/Digital Square team is also working with the MOH and the Agence Nationale d'Ingénierie Clinique, de l'Information et de l'Informatique de Santé (ANICiiS) to implement mHero and other digital tools as part of the COVID-19 response.

More information on how PATH is supporting the COVID-19 response globally is available here.

Training and Learning Programs

In order to advance the skills and capabilities of country-level digital health practitioners and stakeholders, in January 2021, Digital Square launched the Digital Health Applied Leadership Program (DHALP) led by the University of Global Health Equity (UGHE) and a consortium of partners. The initiative aims to strengthen the ability of ministries to own and lead digital transformation efforts which require people with a unique combination of technical skill, leadership ability, and commitment to collaboration. As more countries take ownership of their digital transformation, these digital health champions must come from ministries of health and other government agencies. The goal of the DHALP is to build a cadre of talented, connected, and motivated digital champions within government ministries.

Digital Square is advocating for open source training courses to enable countries and institutions to easily and quickly update their training and learning programs to the latest science and protocols established by normative agencies such as WHO. While the urgency of the COVID-19 pandemic is driving much of the focus on support for frontline health workers and communities, the science and therefore the triage, testing, and treatment protocols continue to evolve. Digital or virtual training options provide an avenue for rapid content updates and refresher training as the situation and guidance continues to evolve.

As part of the DHALP, Digital Square is partnering with TechChange, the World Bank, WHO and the International Telecommunications Union to synergize existing digital health training content into the DHALP curriculum.

In addition to the DHALP, Digital Square can utilize PATH approaches and expertise for training and learning, building capacity in countries to drive toward digital transformation. This includes:

- **Provision of actionable information**
  Digital Square can utilize PATH's existing capabilities in providing actionable information for frontline health workers and their supervisors . PATH has deployed an immunization registry in Tanzania and Zambia via the Better Immunization Data (BID) Initiative, provided a robust pipeline of health, vector, and GIS data through the Visualize No Malaria initiative, and supported the development and national scale-up of Vietnam's electronic immunization registry.
- **Strengthening peer and supervisor feedback loops**
  Digital Square can utilize PATH's capabilities in strengthening feedback loops using lessons from the BID Initiative, PATH's Living Labs platform, and ongoing work in the DRC. These projects incorporate a range of strategies from informal peer communities

on WhatsApp, an SMS platform for rapid information sharing, and human-centered design approaches when designing new interventions on performance management and learning.

- **Support for virtual training**
  PATH's Center of Digital Excellence (CoDE) is working with Gavi to identify existing and innovative digital technologies or virtual training and learning approaches to ensure health workers are adequately trained to boost their performance and impact on quality of service delivery, ensure an effective immediate response to the COVID-19 crisis, and strengthen immunization systems long-term. PATH will manage the three-month implementation of Dimagi's vaccine distribution digital solution built on CommCare in Somalia, TechChange's COVID-19 Digital Classroom in Sierra Leone, and Viamo's Interactive Voice Response platform in the Democratic Republic of Congo. All sub-awardees will use adaptive management to train frontline health workers to use the digital solution, assess the impact of the training approach, and synthesize the findings to be widely distributed and scaled.

Regional and Global Networks

Digital Square provides support to a group of regional and global networks including the Asia eHealth Information Network (AeHIN), the Digital Health & Interoperability Working Group, and the Global Digital Health Network. Through a "network of networks," Digital Square is engaged in active WhatsApp discussions sharing COVID-19 activities and experiences in Asia, Africa, and Latin America. Through this support, Digital Square can identify any redundant efforts, duplicate solutions, and piecemeal approaches as well as provide information on available technologies, capacity building opportunities, and links to resources.