



Global Good Innovator Meeting

December 13, 2019 | Washington, DC

Meeting Report

February 3, 2020

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Abbreviations

CDC	Center for Disease Control
DHIS	Digital Health Information System
DHIS2	Digital Health Information System 2
FHIR	Fast Healthcare Interoperability Resources
LIS CoP	Laboratory Information Systems Community of Practice
OpenCRVS	open source Civil Registration and Vital Statistics
OpenELIS	open source Electronic Laboratory Information System
OpenHIE	open source Health Information Exchange
OpenIMIS	open source Insurance Management Information System
OpenLMIS	open source Logistics Management Information System
OpenMRS	open source Medical Record System
OpenSRP	open source Smart Register Platform
PCMT	Product Catalog Management Tool
PEPFAR	President's Emergency Plan for AIDS Relief
UHC	universal health coverage
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

Executive Summary

The second annual Digital Square Global Good Innovators meeting was held in Washington, DC, on December 13, 2019. The goal of the meeting was to bring together partners of global goods approved through Digital Square, along with the Peer Review Committee and investors, to discuss progress of Digital Square Global Good implementing partners and for the project to share relevant updates for innovators. Fifty-one participants convened for the day, which was full of interactive presentations and discussion. Several of the presentations included lightning round highlights on a handful of global goods, a presentation and discussion on “shelf-ready” global goods, and an updated discussion on the digital health accelerator kits and computable care guidelines. One of the highlights was a panel featuring six donors, who shared some of their reflections and priorities for investment in the space.

In the weeks following, 19 participants completed a post-meeting survey. The majority expressed that the meeting was beneficial to their work and indicated they would attend another Global Good Innovator Meeting in the future.

Background

The second annual Global Good Innovator Meeting was held at PATH’s offices in Washington, DC, on December 13, 2019, following the Global Digital Health Forum. Attended by 51 participants, the purpose of this all-day convening was to discuss progress of Digital Square Global Good implementing partners and for the project to share relevant updates with innovators. The meeting also served as a forum for digital health global good innovators to engage with each other and with investors to share lessons learned on technical and operational topics.

Participants invited to attend the meeting were those who had received funding or had been approved and seeking funding through Digital Square Notices A, B, C, and D; the Peer Review Committee; and Digital Square investors. A full list of participants (pictured below) can be found in Appendix A.



Photo 1: Participants of the 2019 Global Good Innovator Meeting.

Session Notes

This section provides notes from each session, including presentation and discussion content. Collaborative notes were taken in a google document open to all participants. They are available at <https://tinyurl.com/gginnovators>. Slides used during each session can be found in Appendix C.

2019 Digital Square Updates

The meeting was opened at 8:30 a.m. by Amanda BenDor, Partnerships and Community Engagement Manager for Digital Square, who shared the agenda and welcomed participants. Next were updates from Skye Gilbert, Executive Director of Digital Square, who shared a brief look forward to 2020. Gilbert described how Digital Square aims to co-create its strategy, with a draft going live in January for community commenting and input. Digital Square's vision remains focused upon building a world where digitally enabled health services are available to everyone. This involves listening to health leaders and thinking about how to get end user voices more deliberately tied into our work, while also building upon the World Health Organization (WHO) Guidelines. Digital Square continues to concentrate on alignment and co-investment, adaptability, country and regional leadership, capacity strengthening, financing for diversifying global goods, and healthy ecosystems.

Gilbert closed by encouraging the community for feedback to better understand how Digital Square can be most helpful.

“Shelf-Ready” Global Goods and Upcoming Notice E Discussion

The next session turned to “shelf-ready” global goods and the forthcoming Notice E. Carl Leitner, Technical Director of Digital Square, shared a road map for global goods. The two main areas of the road map are shelf readiness and secondary data usage (building off of Notice D). Leitner described that there is a need to make sure software global goods are ready to deploy as stand-alone products that meet the primary data use needs of a tool, hence the attribution of “shelf-ready.” He also addressed the need to ensure that there is digital health infrastructure where point-of-service systems can support secondary data usage such as WHO's work on computable care guidelines and the extraction of indicators and quality measures. He discussed the need to transition from an application infrastructure to a data infrastructure. This means applications can build on data and spend less time on data collection itself.



Photo 2: Participants engage in discussion.

In terms of defining shelf-ready requirements, Leitner outlined a two-phased approach:

- Phase I: Define a set of minimum viable product base criteria that we would apply to all global goods considered to be shelf-ready; those meeting these criteria would be considered production ready and able to support metadata synchronization. The proposed criteria include a required score according to the Global Good Maturity Model, the ability to support standards for data exchange as appropriate for the tool, and alignment with DevOps and Cloud services guidelines and open source Health Information Exchange (OpenHIE) architecture.
- Phase II: For each of the shelves, identify existing functional and interoperability requirements that the tool should fulfill.

Leitner shared that for secondary usage, there is the [Clinical Quality Language for Aggregate Data Exchange White Paper](#), which discusses how to extract transactional data for our systems and data reporting. If the minimum dataset needed is known, a donor agency can update it without changing the code. This also allows for the indicator calculator settings to report to the Digital Health Information System (DHIS).

Leitner also discussed enabling decision-support services (clinical, operational) data with the Fast Healthcare Interoperability Resources (FHIR) standard with the defined minimum dataset using the same structured query language to initiate decision-support actions, and bringing it back so the clinician can get dynamic support for their process. Leitner stated that there is an opportunity to decide how to do this together as a community, using the Instant OpenHIE framework.

Leitner closed by soliciting feedback from the participants on the terms used to define “shelf-ready” global goods and the frameworks presented, which will shape Notice E. There was limited discussion but Digital Square emphasized this continues to be a collaborative process where community input is important.

Global Good Community Newsletter

The following session gave the community an opportunity to provide input on the Global Goods Community Newsletter, which launched in early 2019. During the discussion, which was led by Digital Square’s Bianca Poll (Senior Communications Associate) and Caitlin Bowman (Program Assistant), the session leaders sought feedback to inform the forthcoming Global Goods Community Newsletter and the Community Engagement Strategy for 2020. Poll and Bowman reviewed the current newsletter structure and where to locate past issues on the [Digital Square wiki](#). The participants were asked what other topics and interviews they would like to see and what could be done differently. The participants provided the following feedback:

- Define common terms used in the ecosystem and give examples of their uses to help promote understanding.
- Communicate why we are building our tools. If the tool is related to universal health coverage (UHC), the community would like to better understand how those global goods are working toward achieving UHC.
- Create global goods talking points for the community and a guide for those who are new to working with global goods.
- Curate software releases, new features, internal road maps, and broad project timelines from the community each quarter.
- Create a centralized space where people can share events and discuss new projects, releases, community forums, and challenges.
- Hear about what is not working because those are the organizations that have the most credibility (Tim Wood, sharing from a donor perspective).

Additionally, Poll discussed the [Global Goods Guidebook](#), which was first published in May 2019. The next version will be released in the coming months and will include all Digital Square–supported global goods approved through the Notice C cycle.

The discussion gravitated toward approval or vetting of global goods. Merrick Schaefer explained that the Guidebook is a marketing tool within the United States Agency for International Development (USAID) to promote wider thinking with these tools, and that there is not yet an independent body to certify “global goods”; however, he said, one should aspire to “global goodness.”

Merrick Schaefer also shared the new Global Goods Card Game (pictured on next page). He explained that the content and structure was pulled from the Global Goods Guidebook and aims to promote a better understanding of classifications, global goods, and the interactions between them. Please email merrickweb@gmail.com to ensure your global good is included in the game.

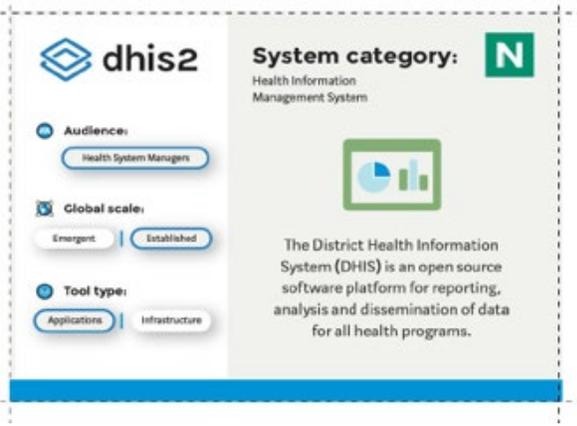


Photo 3: Emily Carnahan and Maguette Ndong play the Global Goods Card Game.

Global Good Lightning Talks

The meeting provided an opportunity for global good innovators to share updates from their implementations. Presenters were given three minutes to share innovative highlights during a lightning round session.

LIS CoP: Jan Flowers (UW I-TECH) discussed the need to understand how to select proper lab product for their use case and what is useful to prioritize. The new Laboratory Information Systems Community of Practice (LIS CoP) was just launched at the OpenHIE meeting in Addis in November and serves as a place for the open source laboratory information system community to share tools, resources, and use cases. The LIS CoP is housed as a subcommunity of OpenHIE.



Photo 4: Emily Nicholson, Merrick Schaefer, and Brian Taliesin.

OpenLMIS and PCMT: Brandon Bowersox-Johnson (VillageReach) stated that they are currently focused on sustainability, business plans, and private-sector engagement. He presented the Product Catalog Management Tool (PCMT), a new product registry tool created in OpenHIE, which aims to provide consistent master data about health products (medicines, vaccines, and commodities) as they are managed throughout a health information ecosystem. The PCMT will help provide consistent product identification, allow interoperability for supply chain visibility, and support adoption of GS1 global standards. Version 1 of the PCMT will be launched in January 2020.

Instant OpenHIE: Richard Stanley (IntraHealth) detailed a new prototype of a new approach to launch OpenHIE demonstration environments quickly without needing to learn tools like GitHub and Docker. Demos would be compatible with Windows, Mac, or Linux and have workflows that illustrate data exchange between solutions within an interoperable set of stacks and/or software tools. Two examples include the open source Health Information Mediator, an interoperability layer, and the HAPI FHIR Server, representing meta data registries. This is an option for software developers that may not know a certain area and provides a method to advocate for interoperability. Stanley showcased a quick demo for participants.

DHIS2-to-Power BI Connector: Rodrigo Gramajo (PSI) described the DHIS2-to-Power BI Connector, which was built with BAO Systems and distributed via DHIS2 CoP. It connects DHIS2 with Power BI.

They are also working on a connector for Tableau, both of which improve data visualization tools within DHIS2. Gramajo concluded by saying they are looking at improving the data visualization tools with DHIS2 Tracker.



Photo 5: Carl Fourie shares updates from open source Insurance Management Information System.

OpenIMIS: Carl Fourie (Digital Square) described that open source Insurance Management Information System (OpenIMIS) is an open source health insurance system that focuses on UHC (pictured at left). Over the last year, they have been creating interoperability workflows. OpenIMIS conducted a live demo at the Global Digital Health Forum, which consisted of Bahmni, an open source Electronic Medical Record, submitting a claim as an actual example of what Nepal is doing. Fourie detailed the creation of an FHIR interface with data flowing into the DHIS2 tracker. In the next year, the OpenIMIS community is looking at investigating the use of

artificial intelligence for claims management and adjudication and updating other functionality of the tool.

Android FHIR library: Craig Appl (Ona) explained how tablet users in the field are responsible for creating reports, which demonstrates a need for health management information systems. Ona is currently building an open source, generalizable reporting library that allows the user to retain ownership on the device. The structure they are developing uses clinical quality language and is able to output indicators and send them out to health management information systems using the Mobile Aggregate Data Exchange on FHIR pattern.

OpenCRVS: Ed Duffus (Plan International) shared that open source Civil Registration and Vital Statistics (OpenCRVS) has a new model for civil registration built in and they are working to avoid vendor lock-in. Duffus explained that it can be used as an advocacy tool and provide a proof of concept that shows what OpenCRVS would look like in the future. Plan International has been the incubator, but it is time to move out in order to address backlog and build community. There is a seed funding request (\$1.1 million) and it would take around 18 months to be self-sustainable. Duffus explained that another option would be a start-up model that could start with a core group of designers and developers working as contractors.

Following the lightning talks, participants dispersed for a long coffee break to further learn and connect about global good progress in 2019.

Breakout Sessions and Priorities for 2020

Digital Square organized three deep dive breakout sessions so that innovators could deep dive into several priority issues. The breakout groups had an opportunity to meet before lunch and later in the afternoon. The goal was to allow sufficient time for the groups to share challenges and identify several priorities for 2020. Digital Square has documented the priorities and will consider them for community support in 2020. Below are the highlights from the three round-table discussions.

Technical

This session (pictured at right), led by Carl Leitner and Carl Fourie, included topics on approaches to quality, FHIR, follow-up to OpenHIE, and “shelf-ready” context. They discussed the challenges of overlapping and parallel workstreams. In particular, they emphasized the need to support broader developers in FHIR and the need to diversify teams. It is important to build local organizations as part of the ecosystem to encourage local group ownership with an increased focus on capacity building. They mentioned that HL7 can help people learn about FHIR. People are willing to help and train, but they do not know the tools well enough. They noted that scholarships could help bring in developers and engineers within the region for FHIR training. Additionally, there needs to be a clear contact for each global good who knows about interoperability. The systems that need to be interoperable do not always have FHIR, but this could potentially be standardized within the community. However, this requires funding on both sides. In regard to OpenHIE, this group discussed developing a standard approach for solving a use case/workflow. Carl Fourie detailed that the group agreed that the priority activities would be determining how to better equip the teams in technical skills around FHIR and looking for opportunities to leverage and provide training courses to build more skills and capacities around the standard.



Photo 6: The technical group discusses challenges and solutions.

Community and governance

This session (pictured at right), led by Amanda BenDor and Bianca Poll, served as a follow-up to previous community manager discussions and challenges. [Notes](#) were taken to supplement previous notes for community managers. The discussion started revisiting some of the challenges community managers face. Jamie Thomas from OpenHIE reiterated that collecting use cases is a challenge for OpenHIE. There were discussions about how to provide feedback—technical versus nontechnical—and use of communication platforms. Different platforms work for different global goods, depending on their scale. Several noted that sharing feedback and recognizing members in the community is a good way to increase community engagement.



Photo 7: The community and governance group discusses strategies.

The group discussed community engagement strategies. Amanda BenDor (Digital Square) noted she creates a strategy each year to guide priorities for global good community engagement. Other community managers do not create a strategy but thought it may be a good idea.

The breakout group also delved into a discussion on gender. Rita Sembajwe (RTI) noted that the Digital Health & Interoperability Working Group is brainstorming ideas for a subcommunity devoted to gender, which could develop guidelines for a community of practice to detail ways to integrate gender into their objectives. Community managers are a critical part of achieving gender equity. Amanda highlighted the book *Invisible Women*, which breaks down the gender data gap.

The group prioritized the following actions for 2020:

- Continue with quarterly community manager meetings to foster ongoing discussion of this group.
- Work to address gender and diversity in our communities.
- Contribute to a virtual “toolkit” with resources for community managers.

Business model and sustainability

This session (pictured at right), led by Heath Arensen (DIAL), focused on innovative business model updates and kicked off with updates from stewards from Logistics Management Information System (OpenLMIS) and open source Civil Registration and Vital Statistics (OpenCRVS), both of which have undergone significant thinking on the appropriate business model for sustainability. Arensen described the challenge between supporting and sustaining a core product, stating that a mature product has many implementers. However, it is important to consider how the income can come back to support the core, as that support is needed to continue year after year. One idea involved having shared resources across global goods for security, design, and quality assurance; however, the challenge is that some roles require in-depth knowledge of that global good. Resources around communication and strategy are much easier to share.



Photo 8: The business model and sustainability group brainstorms ideas.

For OpenLMIS, they discussed a path forward of partnership to handover. This means exploring partnerships that are stewarded by existing partner organizations. They also examined the need to change how they tell the story, potentially shifting from emphasizing patient outcomes to instead highlighting that they are changing how health services are being delivered.

During the latter half of the session, they brainstormed activities for 2020:



Photo 9: Notes from the breakout sessions.

1. Continue to define nuance and definitions of global goods themselves.
2. Convene more dialogue across global goods on sustainability.
3. Work with Resonance and share with rest of community (e.g., OpenLMIS data).
4. Have a single organization act as foundation and fiscal sponsor for global goods to take on some responsibility for governance and community direction setting. Look at people and work back to money; most projects have 3–7 people focusing on core.
5. Establish communities of practice.

Donor Discussion

Digital Square planned a one-hour session for participants to hear from investors in the global good space and ask questions of the donor representatives. Facilitated by Amanda BenDor (Digital Square), they engaged in conversation with Dan Rosen (CDC), Tim Wood (Bill & Melinda Gates Foundation), Mark DeZalia (PEPFAR), Adele Waugaman (USAID), Steven Ramsden (Global Fund), and Karin Kallander (UNICEF). This was one of the most interactive sessions of the day, with high participation from the panel and the global good innovators. The session kicked off with some facilitated discussion questions about

donor priorities in the global good space and goals for the future. The session was then opened up for Q&A. The takeaway from this session was that we, the donors and the implementing community, often seen as sitting on opposite sides of the table, are all in this together and there is a call to action to work together to solve digital health challenges in the most efficient manner. During the discussion, Joaquin Blaya (World Bank), a participant, actually joined the panel to share the World Bank's priorities. The following are a few highlights from the discussion:

- Steven Ramsden explained that the rapid acceleration of technology around data, analytics, and machine learning is an opportunity for us to make more impact, but we need to make sure we do it in a way that is sustainable, scalable, and ethical.
- Adele Waugaman stated that we are now talking about global goods in a more systematic way (e.g., how to standardize approaches, reflecting on the maturity of the global goods, using common language, and what journeys look like). We still have challenges but now we are having transparent conversation across donors about how to sustainably scale these tools and build momentum to continue making progress.
- Karin Kallander described how she has seen an increased willingness within the community to share soft content like standards of procedure, and that it is important to be transparent and sharing.
- Tim Wood highlighted the need to have tools in place and foundational items like the Microsoft Office package. Wood also emphasized the lack of core funding and limited government actors driving innovation.

What can the community do to help you fund global goods?

- Tim Wood said that knowing the impact of the global good is crucial because it is challenging to invest in a software without showing how many lives can be saved by the system.
- Dan Rosen added that it is necessary to discuss costing. It is important to know the cost per person or overall. It is also necessary to demonstrate success and that the products work.
- Merrick Schaefer stated that core software platforms do not generate the impact or cost of a tool or how implementers use it. He asked: Is it fair to ask the underlying platforms to measure their impact and cost out the implications?
- Dan Rosen said that he needs to know how to tell the story so that he can make a case for it.
- Tim Wood expressed that there needs to be more conversations about efficiency in health systems. There is not enough funding in systems to meet goals for UHC2030. Digital is becoming more efficient and that needs to be shown in terms of health worker efficiency and dollar cost.
- Mark DeZalia advised including the start date, explaining how to manage a platform to collect data, and addressing challenges. The impacts do not have to be in dollars or widely reviewed studies; data that is high quality is sufficient. It is important to show value of data in the platforms. It is also necessary to consider how long it takes to show the cost effectiveness and to document that.
- Adele Waugaman explained that as donors, they are asking to go beyond core responsibilities to help make this use case. It is necessary to work together to create an annual state of global goods survey to track great challenges that inhibit the effect of scaling these tools. Tracking this annually can help



Photo 10: Facilitated by Amanda BenDor, the session features investors sharing challenges and priorities for global goods.

donor organizations reflect and analyze where to redouble efforts. This can also help in terms of innovation and sustaining global goods.

- Dan Rosen stated that data science has traction, especially in terms of analytics. It is crucial to understand each agency's value proposition and how digital health fits into that.
- Steven Ramsden added that digital health is a new area where many health experts do not understand the benefit, so there is a need to focus on impact. It is important to demonstrate the ability to solve specific problems that can be scaled across all countries. It is helpful to address specific cases and pain points.
- Joaquin Blaya was part of the open source Medical Record System (OpenMRS) community up to nine months ago. He joined because there were new innovations in the digital health consulting organization in his group. There is increasing demand from World Bank country teams who want to work in this area but do not know how.
- Steven Ramsden said that the Global Fund has the same model as the World Bank in countries. He noted that they do not have criteria in how to select global goods, so they sometimes choose the private sector. There is a need to help countries select the right tools, like global goods.
- Steven Ramsden also mentioned that there is a need for improved communication with donors. It is important to frame global goods as ecosystems and the impact of this using strong writing and storytelling. This helps to make a business case to explore private-sector partnerships.

Digital Accelerator Kits and Computable Care Guidelines

Following lunch, a presentation was held to follow up on previous discussions about accelerator kits and computable care guidelines. Led by Garrett Mehl (WHO), Nat Ratanaprayul (WHO), and Jenny Thompson (Digital Square), the discussion highlighted the work being done on accelerator kits and computable care guidelines. These digital accelerator kits aim to increase access and guidance to countries to implement person-centered digital tracking and decision-support systems for service delivery and accountability, based on WHO guidelines. Their long-term vision is to have digital accelerator kits and dynamic clinical algorithms applied to all health areas.

To inform the design of these systems, the kits are composed of standardized documentation of common workflows, core data elements mapped to common standards such as ICD and SNOMED, decision-support algorithms, functional requirements, metrics, and reporting indicators. Using content in the accelerator kits, base technical content is being developed that can be used as a starting point for countries to adapt the content to meet their needs and is also meant to facilitate adoption by software engineers. Structured content in this area includes computable care guidelines expressed as HL7 FHIR and clinical quality language artifacts.

Closing

The closing session, led by Amanda BenDor and Carl Leitner, allowed participants to reflect on the day's meeting and priorities for 2020. The participants shared that they were grateful for the opportunity to meet and collaborate in person following the Global Digital Health Forum. One participant noted that "the energy in the room and level of engagement were both high," despite it being at the end of a busy week. There was strong support for a 2020 innovators meeting. The meeting closed at 4:00 p.m.

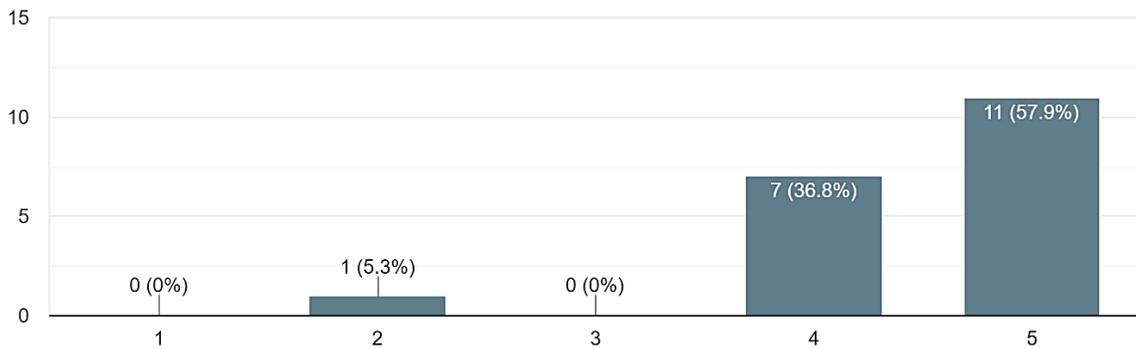


Photo 11: Members of Digital Square: Carl Fourie, Jenny Thompson, Caitlin Bowman, Amanda BenDor, Carl Leitner, Maguette Ndong, Bianca Poll, and cats.

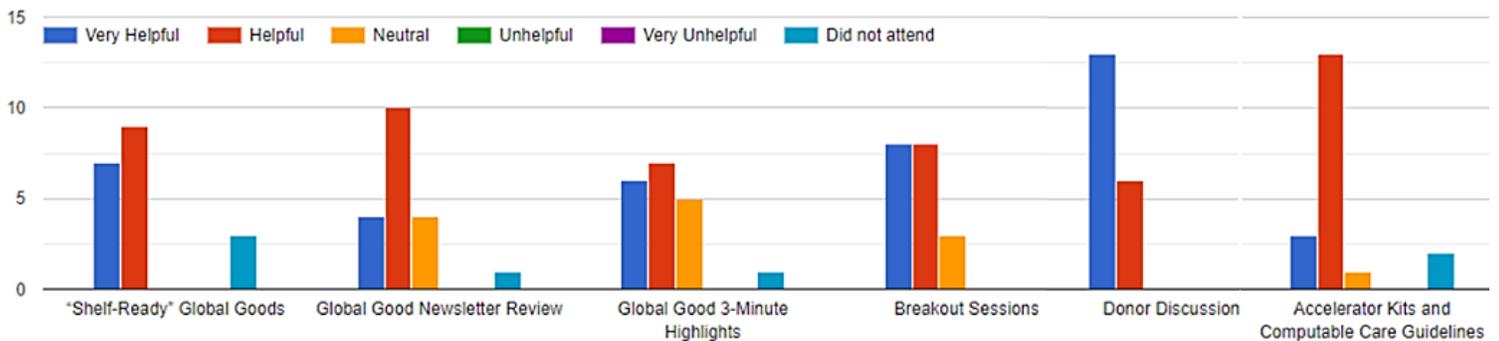
Post-Meeting Survey

A post-meeting survey was sent to participants to gauge their reflections on meeting content and to provide a space for sharing additional feedback. Below are the questions included in the survey, along with the responses received from 19 participants.

1. Do you feel this meeting was beneficial to your work implementing global goods? (On a scale of 1 to 5, where 1 is not beneficial and 5 is very beneficial.)



2. How helpful were each of the sessions?

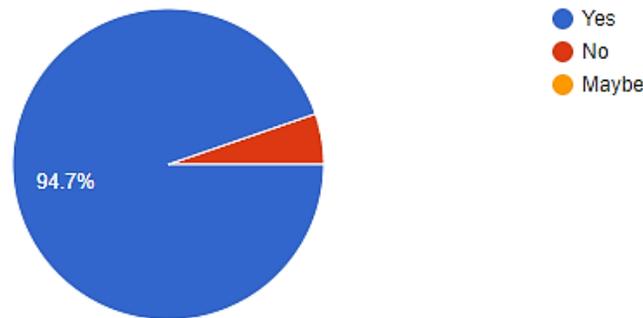


3. Is there a topic we did not discuss that you wish had been on the agenda for this meeting?

Participants offered the following feedback:

- *May want to invite and create some sessions geared towards the beneficiaries or country-level government representatives who have benefited from the global goods being supported by Digital Square.*
- *Commercial software and global goods (e.g., using Power BI or commercial API managers or Facebook-based bots with data going into DHIS2).*

4. Would you attend another Global Good Innovator Meeting in the future?

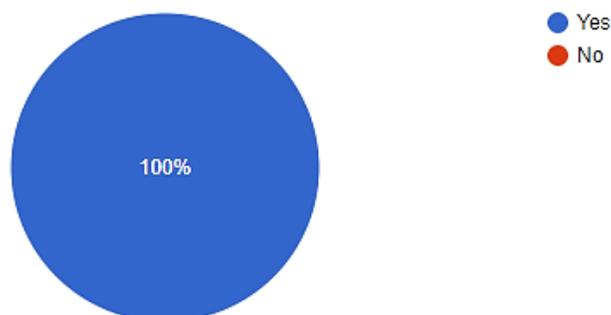


5. What would you like to see as a follow-up to this meeting?

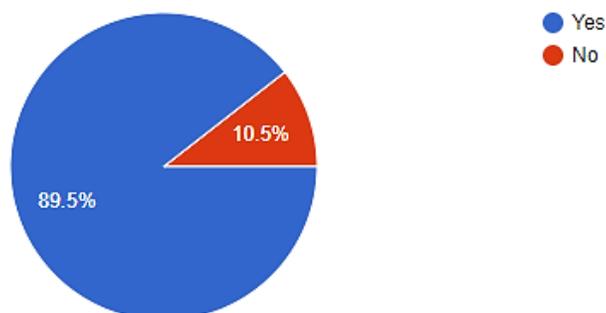
Participants offered the following feedback:

- *Some of the recommendations about the newsletter should be implemented. Lots of great ideas and suggestions were generated.*
- *Ideas around FHIR trainings for global good developers.*
- *Progress on adoption of guidelines for global goods versus the application of the Guidebook.*
- *More about the WHO initiatives on FHIR.*
- *How to have more local organizations and providers selling services on these platforms.*
- *Invite other funders who might be willing to fund the core organization(s) of the global goods.*
- *A longer donor session to really get a good grasp of how they appreciate and want to support the global goods.*
- *More info profiling implementations (including case studies of successes and failures) of global goods supported by Digital Square and key impacts from those investments.*
- *Bring in other players; there are other companies with good models for global goods. I know a few here in Switzerland that can help the community.*

6. Was the venue sufficient for this meeting?



7. Did the catering menu fill your needs?



8. Would you like to leave any additional comments?

Participants offered the following suggestions:

- *The meeting catered to more technical stakeholders rather than implementers, so it would be nice to have more of a balance next time.*
- *Well done on the organization of the day—it was a great chance to get to know the people in the group.*
- *Even though many participants had been in meetings for many days prior, the energy in the room and level of engagement were both high. Thanks, Digital Square!*
- *Thank you for coordinating and hosting these meetings; they are a great opportunity to interact and learn with Digital Square and fellow funded global good partners.*
- *How about doing it in Geneva next time?*

Appendix A. Participant List

Name	Organization	Email
Adele Waugaman	USAID	awaugaman@usaid.gov
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Appendix B. Meeting Agenda

Time	Session Title	Facilitator/Presenter(s)
8:00–8:30 am	Check-In, Breakfast, Chit-Chat	
8:30–8:40 am	Welcoming Remarks–Goals for the Day	Amanda BenDor
8:40–9:00 am	2019 Update of Digital Square	Skye Gilbert
9:00–9:40 am	“Shelf-Ready” Global Goods and upcoming Notice E; Discussion	Carl Leitner
9:40–10:00 am	Global Good Newsletter Review: Feedback from Community	Bianca Poll, Caitlin Bowman
10:00–10:30 am	Global Good Lightning 3-Minute Round Highlights Innovators will share status of their work and one innovative highlight from 2019: <ul style="list-style-type: none"> ○ LIS CoP ○ OpenLMIS and PCMT ○ Instant OpenHIE ○ DHIS2 BI Connector ○ OpenIMIS ○ Ona Android FHIR library 	Facilitated by Amanda BenDor Jan Flowers Brandon Bowersox-Johnson Richard Stanley Rodrigo Gramajo Carl Fourie Craig Appl
10:30–11:00 am	Coffee Break; Networking	
11:00 am–12:00 pm	Breakout Session 1—Delving into Challenges <i>Technical</i> Round-table discussion. Topics to cover include: Approaches to quality; FHIR; Follow-up to OpenHIE; “Shelf-Ready” Context <i>Community and Governance</i> Round-table discussion. Follow-up to community manager discussion and documentation of challenges <i>Business Model and Sustainability</i> Round-table discussion. Updates on business model activities from OpenLMIS and OpenCRVS	Facilitators: Carl Leitner and Carl Fourie Amanda BenDor and Michael Downey Skye Gilbert and Heath Arensen
12:00–1:00 pm	Donor Discussion	Facilitated by Amanda BenDor Mark DeZalia, Karin Kallander, Steven Ramsden, Dan Rosen, Adele Waugaman, Tim Wood
1:00–1:45 pm	Lunch and More Networking!	
1:45–2:30 pm	Accelerator Kits and Computable Care Guidelines	Nat Ratanaprayul, Garrett Mehl, Jenny Thompson
2:30–3:30 pm	Breakout Session 2—Delving into Solutions, Needs and Priorities for 2020 Each group will convene and dedicate time to outlining solutions to challenges and make a list of priorities for stakeholders and investors in 2020 and beyond. The groups will nominate someone to share a read-out in the subsequent session.	Facilitators: Carl Leitner and Carl Fourie (Technical) Amanda BenDor and Michael Downey (Community and Governance) Skye Gilbert and Heath Arensen (Business Model and Sustainability)
3:30–4:15 pm	Group Discussion—Priorities for 2020 Each group will share their priorities for 2020; facilitator will guide a larger group discussion.	Amanda BenDor and Michael Downey
4:15–4:30 pm	Closing, next steps	Amanda BenDor

Appendix C. Presentation Slides



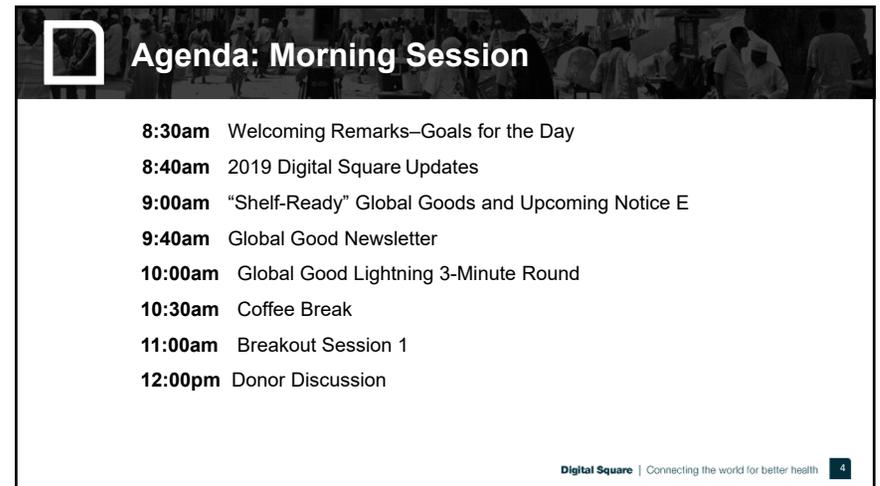
1



2



3



4



D **Agenda: Afternoon Session**

- 1:00pm** Lunch
- 1:45pm** Accelerator Kits and Computable Care Guidelines
- 2:30pm** Breakout Session 2
- 3:30pm** Group Discussion–Priorities for 2020
- 4:15pm** Closing Remarks and Next Steps

Digital Square | Connecting the world for better health **5**

5



2019
Digital Square
Updates

6



“Shelf-Ready”
Global Goods &
Upcoming Notice E
Discussion

7

Roadmap for Global Goods

Carl Leitner -
Technical Director - Digital Square

8

8

What is a Global Good?

- **Software** A software tool that is free and open-source which used to manage, analyze or transmit health related data and has proven utility in several settings.
- **Services** A software tool which 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 which is available under an open license and that is used to improve or analyze health data management processes.



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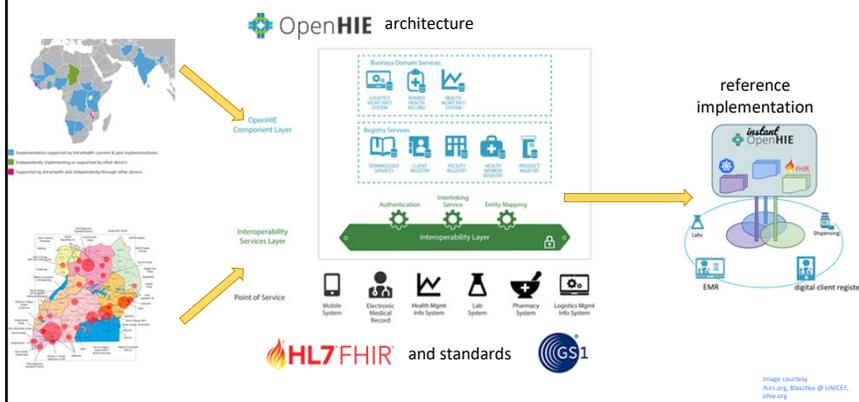
Where are we going in the roadmap?

- **Shelf-Ready** We want to make our software global goods are ready to deploy as stand alone products which meet the primary data use needs of a tool. Two phases
- **Secondary Data Usage** Ensure that we have digital health infrastructure so that point of service systems can support secondary data usage such as WHO's work on Computable Care Guidelines and the extraction of indicators and quality measures.

10

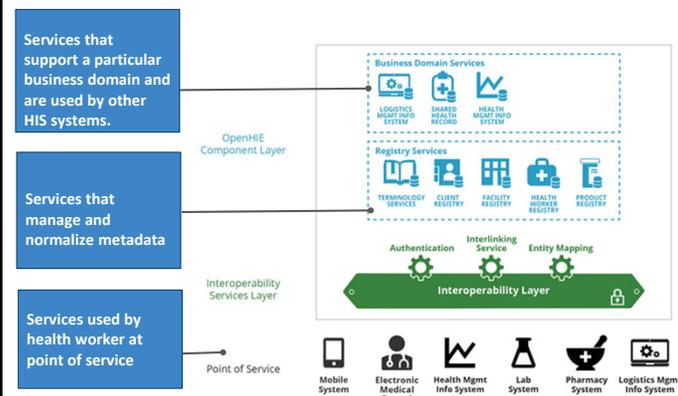
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How do we get there?



11

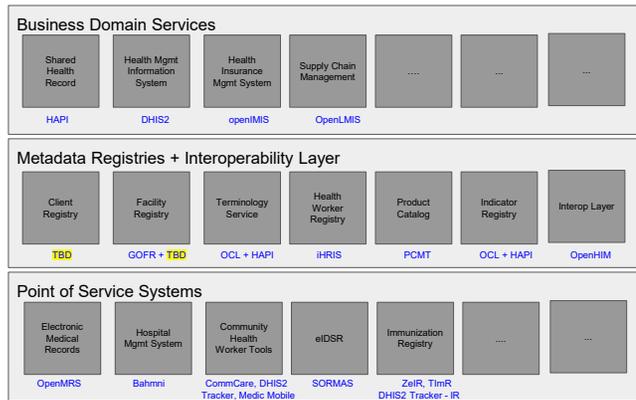
Scaffold for shelves - OpenHIE Architecture



12

12

Three tiers of shelves and potentials for shelf-ready tools



13

13

Shelf Ready Requirements

Two phased approach for defining shelf ready requirements

- **Phase I** define a set of MVP base criteria that we would apply to all global goods considered to be shelf-ready to be considered production ready and support metadata synchronization.
- **Phase II** for each of the shelves identify existing functional and interoperability requirements that the tool should fulfill.

If needed, support the development of those requirements

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Shelf Ready Requirements Phase I (DRAFT)

- Required score according to [Global Good Maturity Model](#)

- **Global Utility**
 - Digital Health Interventions (high)
 - Source Code Accessibility (high)
- **Community Support**
 - Software Roadmap (medium)
 - User Documentation (medium)
 - Multi-Lingual Support (medium)
- **Software Maturity**
 - Technical Documentation (medium)
 - Software Productization (medium)
 - Interoperability & Data Accessibility (medium)
 - Security (medium)
 - Scalability (medium)

- Supports standards for data exchange as appropriate for the tool

- Aligns with [DevOps & Cloud-Services](#) guidelines

- Aligns with [OpenHIE Architecture](#)

- Refining the maturity model**
- Installation and Deployment**
 - Installation reports
 - Ease of deployment and enterprise deployment strategies
 - Quality Assurance and Testing**
 - level of testing
 - identifying and addressing your major risk areas and testing them
 - Product Documentation**
 - Documentation for users
 - Training material
 - Product Information**
 - 2 page brochure stuff – ie. what does it do.

15

15

Phase II Example: National Product Catalogs

Functional Requirements (Currently in development) A National Product Catalog should support for regulatory approval workflows for medical commodities and support effective management of commodities coming into central medical stores and distribution through the supply chain



For country supply chains and health systems to interoperate, it is critical to have all health facility data in a country-wide Facility Registry (Master Facility List) to ensure synthesis of health systems data across health facilities. The mCSD standard, a profile based on HL7 FHIR, defines synchronization workflows and provides the means to share and cross-reference multiple health facility identifiers such as GS1's GLNs with the facility identifiers used by a Ministry.

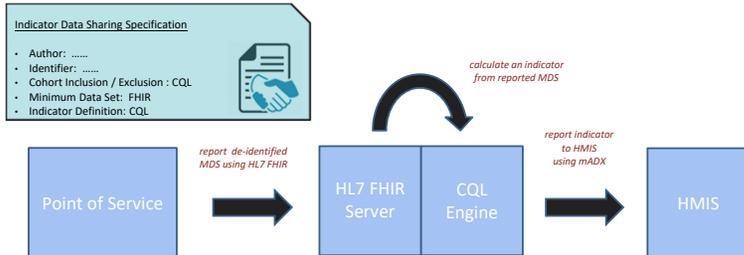
Health data collection efforts should be able to report indicators into an HMIS (including DHIS2), such as stock-outs and stock levels by using the mADX standard based on HL7 FHIR.

Insurance claims are submitted using HL7 FHIR standards and includes listing of medical commodities dispensed. Often local code systems are used which need to be mapped to standardized identifiers.

16

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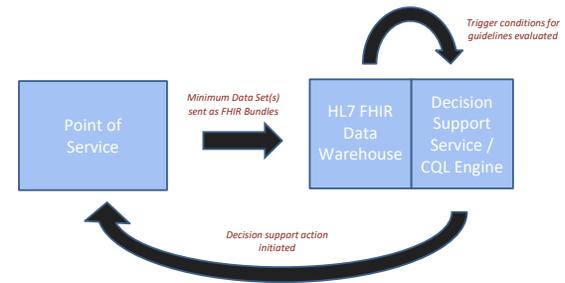
Secondary data usage: indicator extraction (IHE White Paper: CQL for ADX)



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17

Secondary data usage: decision support/CCG



18

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Working together

Instant OpenHIE

OpenHIE Sub-communities

- Labs
- Supply Chain
- Community Health
- Health Financing/Insurance

Standards Development

- IHE profiles, ensuring HL7 FHIR meets our needs
- WHO accelerator kits & computable care guidelines

19

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Past Newsletters

The screenshot shows a newsletter page with the Digital Square logo and the tagline 'connecting the world for better health'. The main content includes a 'Recap of the 2019 OpenHIE Community Meeting' with a photo of a meeting, a 'Snapshot of a Global Good Partner: Annina Wersun, Plan International' with a photo of Annina, and an article titled 'Bringing together organizations in support of technology enabled solutions at the Global Digital Development Summit' with a photo of a summit. The footer includes the Digital Square logo and the tagline 'Connecting the world for better health' with the page number 21.

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Where to Find the Newsletter

The screenshot shows a web page titled 'Global Goods Community' with a search bar and a list of newsletters. The list includes '1 Global Good Webinars' with sub-items '1.1 Upcoming Webinars', '1.2 October 30, 2019 | Technical Highlights Across Our Community', '1.3 September 26, 2019 | WHO-UNFPA Accelerator Kits and Secondary Data Usage', '1.4 July 29, 2019 | HCT FWH', and '1.5 September 26, 2019 | Resource Mobilization and the Global Goods Guidebook'. The '2 Global Goods Community Newsletter' is circled in orange. The footer includes the Digital Square logo and the tagline 'Connecting the world for better health' with the page number 22.

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Current Structure

- Current structure:
 - Global good spotlight: brief summaries of the global good
 - Snapshot of a global good partner: interview
 - Digital Square announcements
 - Upcoming events
 - Reading corner: highlights of the quarter curated by Digital Square

The footer includes the Digital Square logo and the tagline 'Connecting the world for better health' with the page number 23.

23

Discussion

- What topics would you like to see?
- Who else would you like to see interviewed?
- What do you like best about the newsletters?
- What would you do differently?

The footer includes the Digital Square logo and the tagline 'Connecting the world for better health' with the page number 24.

24

D DigitalSquare.org

Home Page

What We Do

Global Goods

Global goods are adaptable, interoperable, open source software or content designed to meet the data and management needs of country health systems.

Digital Square promotes the development, adoption, and reuse of digital health global goods. We partner with innovators to increase the availability, adaptability, and maturity of high-quality software, service, and content options for countries.

- 20 global goods
- Global Goods Community
- Global Goods Guidebook

We have supported 20 global goods through 38 investments that provide core services to more than 50 countries.

Digital Square supports a community of global good developers and implementers with webinars and other services.

Earlier this year, Digital Square published its first compendium of health software global goods in the Global Goods Guidebook.

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D Digital Square Approved Global Goods

Digital Square promotes the development, adoption, and reuse of **digital health global goods**. We partner with innovators to increase the **availability, adaptability, and maturity** of high-quality software, service, and content options for countries.

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D Global Goods Definition

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 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.

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D Global Goods Guidebook Overview

- Version 1.0 was released in May 2019
- Helps donors align around scalable, sustainable, accessible, interoperable, and evidence-based digital health global goods that meet country priorities
- Features 18 global goods approved for investment through Digital Square
- Includes frequently asked questions and resources for HIS novices, designers, evaluators, and integrators
- Endorsed by USAID, Bill & Melinda Gates Foundation, Digital Impact Alliance, GIZ, and UNICEF

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Where to Find the Guidebook

Global Goods Guidebook

SEPTEMBER 13, 2019

The Global Goods Guidebook showcases emergent and established global goods that are approved for investment through Digital Square. By better coordinating the development of digital health global goods, such as those presented in the guidebook, stakeholders involved in digital health can reduce duplication and ensure that platforms are not only more aligned with national priorities, but that they strengthen health systems.

DOWNLOAD VERSION 1.0

Version 1.0 includes 18 global goods and 5 endorsements including the Bill & Melinda Gates Foundation, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ), DfK, UNICEF, and the United States Agency for International Development (USAID).

Release date: May 28, 2019

Approved versions of the Global Goods Guidebook can be found on the Digital Square web page.

Additional technical information on Digital Square's global goods can also be found on our site.

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Global Good Lightning Talks: 3-Minute Round

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Global Good Lightning Talks

- LIS COP: Jan Flowers
- OpenLMIS and PCMT: Brandon Bowersox-Johnson
- Instant OpenHIE: Richard Stanley
- DHIS2 BI Connector: Rodrigo Gramajo
- openIMIS: Carl Fourie
- Ona Android FHIR Library: Craig Appl

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Coffee Break Networking

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 Breakout Session 1—Delving into Challenges

- **Technical:** Round-table discussion. Topics to cover include: Approaches to quality; FHIR; Follow up to OpenHIE; “Shelf-Ready” context. (Facilitated by Carl Leitner and Carl Fourie)
- **Community and Governance:** Round-table discussion. Follow up to community manager discussion and documentation of challenges. (Facilitated by Amanda BenDor and Michael Downey)
- **Business Model and Sustainability:** Round-table discussion. Updates on business model activities from OpenLMIS and OpenCRVS. (Facilitated by Skye Gilbert and Heath Arensen)

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13 December 2019
Global Goods Innovators Meeting

Ongoing Work on Computable Guidelines, including WHO Digital Accelerator Kits

WHO Department of Reproductive Health and Research
+ many contributors

Twitter @HRPresearch Dr. Garrett Mehl and Natschja Ratanaprayul (Nat), on behalf Working Groups




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Countries are increasingly focused on shifting from paper/legacy systems to person-centered digital tracking and decision support systems at the point of care...but there are challenges in translating Guidelines into Digital Systems

- Challenge:** Governments and partners are faced with competing digital products with unknown health content, possible misinterpretation of recommendations, and vendor lock-in
- Challenge:** Translating narrative recommendations into digital systems may result in misinterpretations by software developers and limit quality assurance of the health content

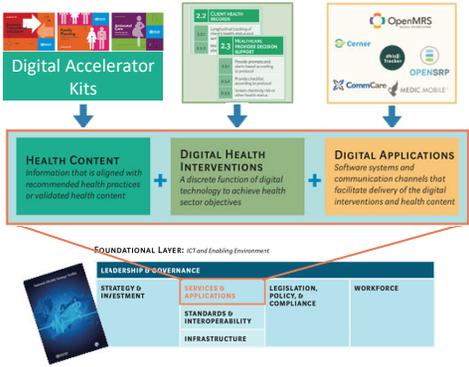


- Solution:** A practical and staged approach to planning, and coordinated investment needed to progress maturity, from paper to harmonized system
- Solution:** Minimum health content and functionality defined, to drive standardization, and for assessment of existing tools
- Solution:** Consistency of methods, documentation, for quality check, country grounding

39 Twitter @HRPresearch 

39

As WHO, we want to ensure fidelity of the health content – independent of the software systems



The diagram illustrates a layered model for digital health. At the top, 'Digital Accelerator Kits' (with logos for OpenMRS, Cerner, and others) feeds into 'HEALTH CONTENT' (information aligned with recommended health practices). This content is combined with 'DIGITAL HEALTH INTERVENTIONS' (a discrete function of digital technology) to create 'DIGITAL APPLICATIONS' (software systems and communication channels). All three are supported by a 'FOUNDATIONAL LAYER: ICT and Enabling Environment', which includes 'LEADERSHIP & GOVERNANCE', 'STRATEGY & INVESTMENT', 'SERVICES & APPLICATIONS', 'STANDARDS & INTEROPERABILITY', 'LEGISLATION, POLICY, & COMPLIANCE', and 'WORKFORCE'.

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Overall framework for translating guidelines to executable clinical decision support (CDS) into digital systems

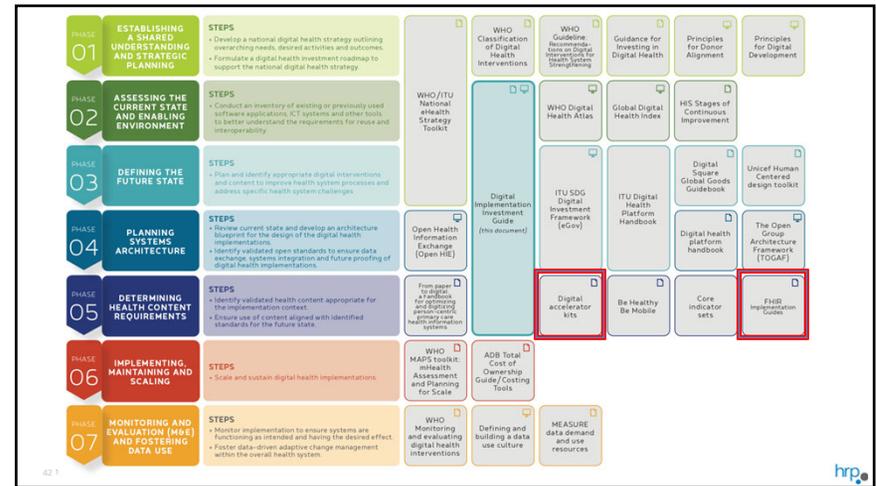
Knowledge Layer	Description	Example	WHO Products (Examples)
L1	Narrative	Guideline for a specific disease that is written in a narrative format – based on peer reviewed articles	Existing WHO recommendations and guidelines e.g. "WHO recommendations on antenatal care for a positive pregnancy experience"
L2	Semi-structured	Flow diagram, decision tree, or other similar format that describes recommendations for implementation	Digital Accelerator Kits for Antenatal Care, Family Planning, Sexually Transmitted Infections, with Adolescent Health overlay → HUMAN READABLE
L3	Structured	Standards-compliant specification encoding logic with data model(s), terminology/code sets, value sets that are ready to be implemented	<ul style="list-style-type: none"> FHIR Resource Mapping Computable Guidelines (CQL + FHIR) → COMPUTER/MACHINE READABLE
L4	Executable	CDS implemented and used in a local execution environment (e.g., CDS that is live in an electronic health record (EHR) production system) or available via web services	Reference software (e.g. WHO Antenatal Care (ANC) module & other modules built on software global goods) & content in FHIR API → SOFTWARE APPLICATION

Adapted from: Bowala, AA, et al. A multi-layered framework for disseminating knowledge for computer-based decision support. *J Am Med Inform Assoc* 2011;18(11):132-139; Maria Michaels (CDC) (2019).

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[Discover kits](#)
[Adapt a kit](#)
[Get started](#)
[Sign in](#)

What is a Digital Accelerator Kit?

The digital accelerator kit aims to provide a bridging language across various audiences: health programme managers, software developers, and business analysts to ensure a common understanding of the appropriate health information content within a defined health programme area, as mechanism to catalyze the effective use of these digital systems.

- How to use a digital accelerator kit?
 - Fictum, deserunt mollit anim laborum astutumque! Praeterea iter est quodam res quas ex communi. Tityre, tu patulae recubans sub tegmine fagi dolor. Qui ipsorum lingua Celtae, nostra Galli appelluntur et malesuada fames.
- What are the complementary resources?
- What are the scenarios of use?
- What are the components of a kit?

[Go to FAQ page >](#)

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[Discover kits](#)
[Adapt a kit](#)
[Get started](#)
[Sign in](#)

Looking for a Digital Accelerator Kit?

Please select a health area to list the related kits to it:

134 kits in 17 countries

Contraception

Gender-Based Violence

44

L2 – Semi-Structured Digital Accelerator Kits

45

Scenarios of use for digital accelerator kits

Scenario 1: Content Alignment with WHO
 “I have a digital system but want to ensure the data and decision support content aligns with WHO norms and standards”

Scenario 2: Digitalizing Paper Systems/Registers
 “I am transitioning paper-based processes to digital systems and need to streamline data needs and decision logic”

Scenario 3: WHO Guideline Adoption
 “I want to implement WHO guidelines in a digital system but do not know where to start”

Scenario 4: Standards Compliance
 “I want to ensure my digital system uses standards, including ICD and FHIR”

...and many more

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Components of a digital accelerator kit

ILLUSTRATIVE

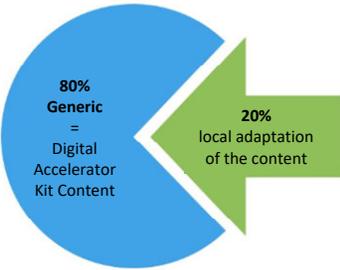
<p>Health Interventions & Recommendations</p> <p>Relevant health interventions and recommendations from the WHO guideline and guidance</p>	<p>Generic Personas</p> <p>Roles, responsibilities, Competencies and essential interventions performed by targeted personas</p> 	<p>User Scenarios</p> <p>Brief narrative description of how the targeted personas may engage with the digital system</p> 	<p>Business Processes & Workflows</p> <p>Generic workflows representing clinical and non-clinical processes</p> 
<p>Core Data Elements</p> <p>Data elements, used for clinical decision-making, indicators, and other data needs</p> 	<p>Decision Support Logic</p> <p>Decision tables representing counselling and treatment algorithms, scheduling logic</p> 	<p>Indicators & Monitoring</p> <p>Indicators for reporting and monitoring with numerator, denominator of data elements based on existing guidance</p> 	<p>Functional Requirements</p> <p>A non-exhaustive list of key functions and non-functional requirements for a digital tracking and decision support system</p>

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“80/20” Principle

Note: There is also the handbook **Optimizing person-centered tracking and Decision-support Systems: A Handbook for Digitalizing Primary Health Care**



80% Generic = Digital Accelerator Kit Content

20% local adaptation of the content

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In the pipeline

- ANC
- Family Planning
- STIs
- + Adolescent health overlay for all

Currently in draft form

- HIV
- Immunizations
- Home-based Records

In progress

...and continuously looking to incorporate opportunities for integration across the different modules

Twitter @hrpResearch World Health Organization hrp

L3 – Structured Computable Guidelines

Key artifacts contained in L3 – Structured

L3 can be further broken down into 3 sub-levels

Layer 3

Working Group to Author CQL

Tier 1 Value Sets & Structure Definition
(Data Elements = Floor)

- All data elements in the data dictionary from L2 are mapped to FHIR resources and other standard concepts (e.g. SNOMED, ICD, LOINC, etc.) where applicable – independent of any software
- Creation of concepts if existing code dictionaries do not contain the needed concepts (if necessary)
- Develop FHIR resources needed for all of the concepts in the data dictionary and package them so they can be imported into a FHIR server

Allows for Machine Learning

Tier 2 Computable Business Logic
(CDS Logic)

- Develop **Computable Business Logic** based on the fields that are defined to this point
- Plan Definition, Activity Definition
- Clinical decision support statements (CQL statements)
- CDS Hooks
- Measure & Measure report (MADX representation of indicators, including indicators using CQL)

Creates mechanism to deploy Machine Learning algorithms

Tier 3 Computable Form Definition
(Form Logic Descriptions = Ceiling)

- Define **Form Structure** in a computable format
- FHIR Questionnaire resources that fully describe the UI (except the presentation layer itself) and capture things like skip logic, form processing, etc.
- Data model for the collection instrument. You can fully describe the collection instruments involved

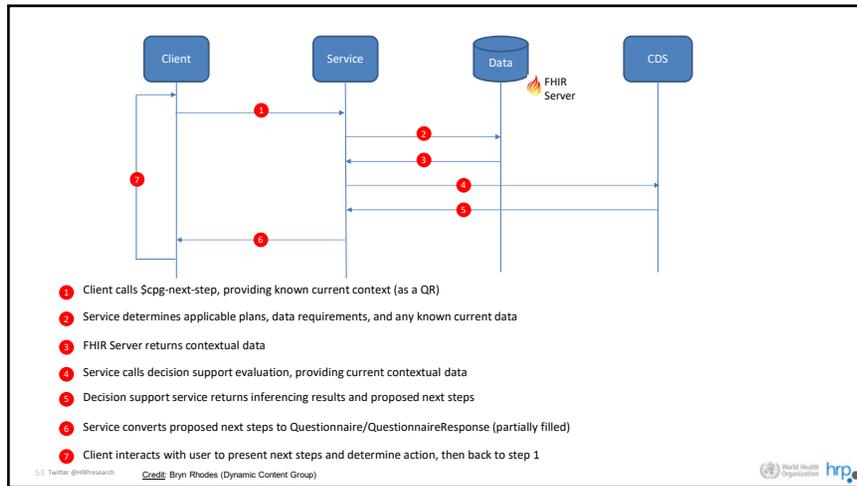
Twitter @hrpResearch Tools to support creation of these artifacts: FHIR Implementation Guide CIG | L3 Checklist | FHIR Indicator whitepaper | Guided Prescribing Implementation Guide | FHIR PC Dynamic Care Planning | CDS Authoring Tool | Artifacts | CDS Connect Repository | CQL Implementation Guide World Health Organization hrp

Example: Computable Guideline for Recommendation A2: Iron & Folic Acid Supplements

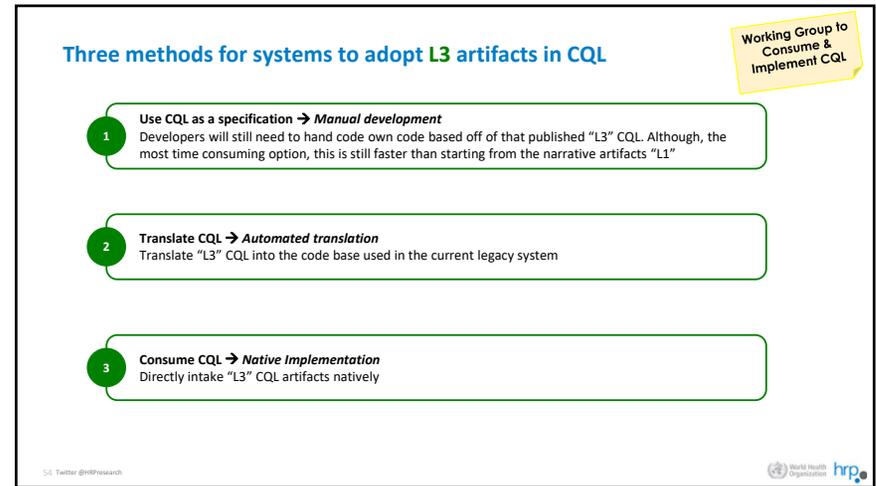
The screenshot shows a CQL implementation guide for Recommendation A2: Iron and Folic Acid Supplements. It includes the guideline text, a flowchart of the logic, and a table of resources. The flowchart shows a decision tree starting with 'Assess' and leading to 'Check' and 'Check Yes' steps. The table lists resources like 'Anemia', 'Iron and folic acid supplements', and 'CQL' with their types and descriptions.

Can be accessed here: <http://build.fhir.org/ig/who-int/anc-cds/index.html>

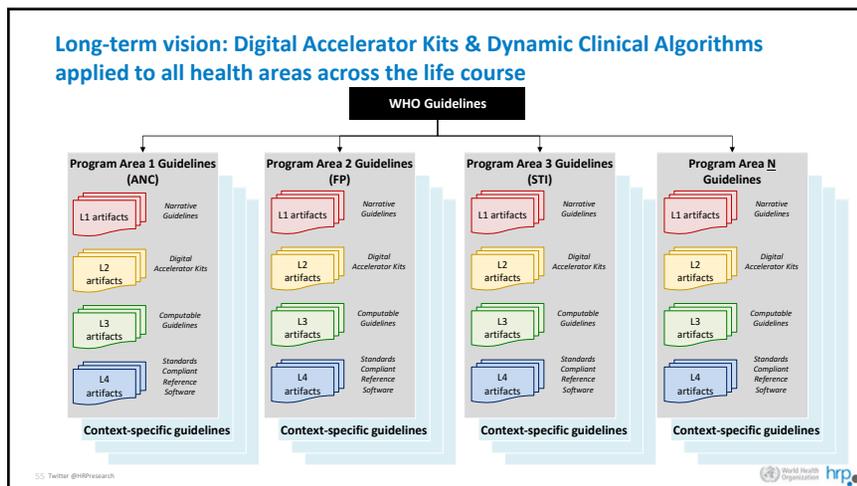
Twitter @hrpResearch World Health Organization hrp



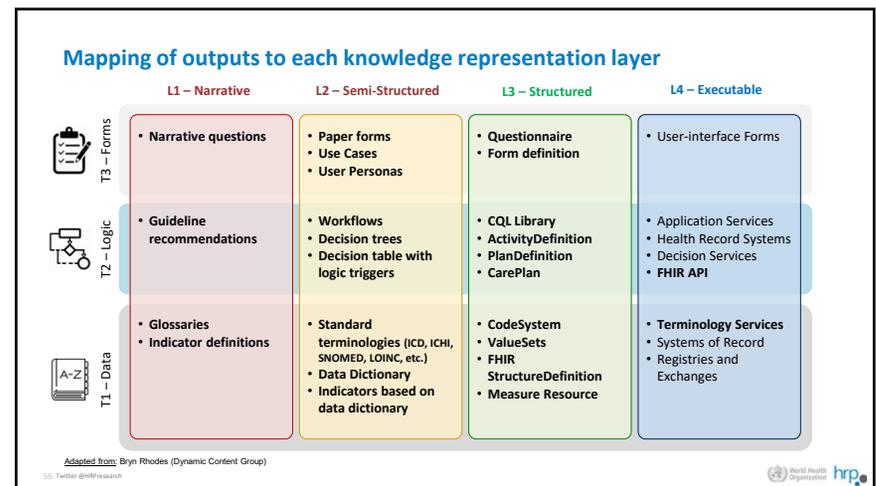
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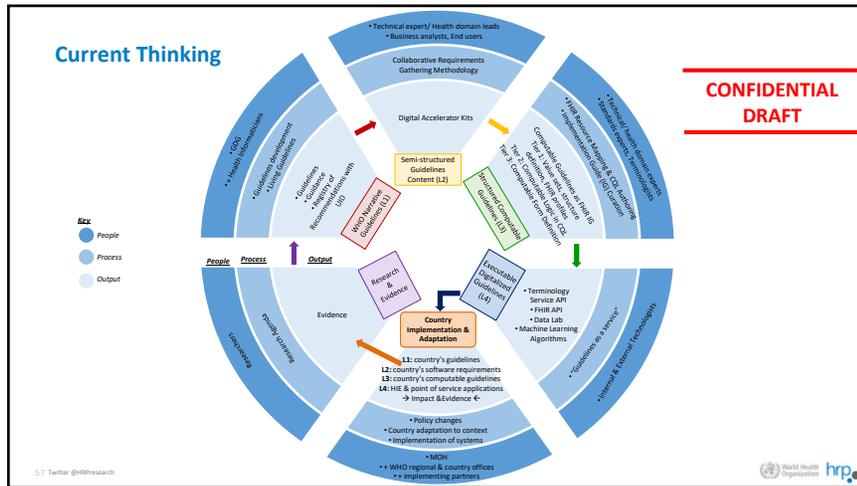
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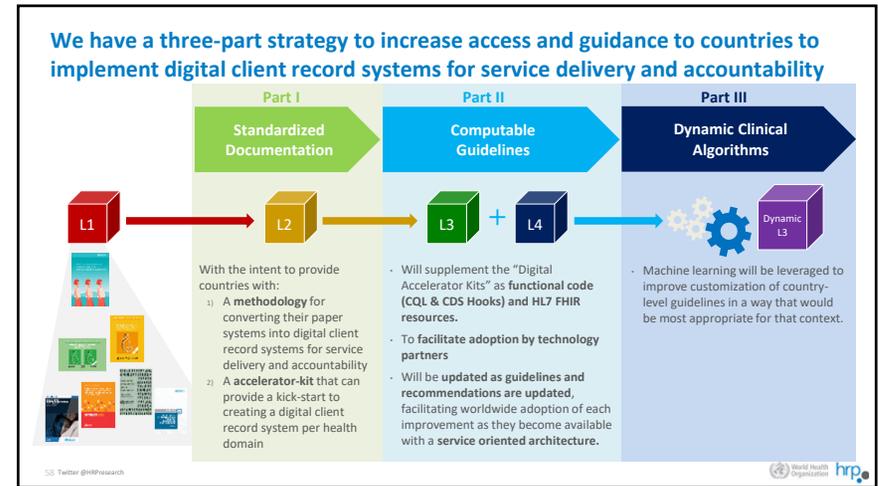
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- ### Working Groups
- ❑ Creation of L3 Computable Guidelines
 - ❑ Technology partners working toward implementing L3 Computable Guidelines
 - ❑ Writing a white paper to help WHO operationalize the vision for computable guidelines
- Please let us know if you would like to join any/all working groups!*
- 59 Twitter @HRResearch World Health Organization hrp

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Thank you!

For more info please contact:

- Garrett Mehl <mehlg@who.int>
- Natschja Ratanaprayul (Nat) <ratanaprayuln@who.int>
- Tigest Tamrat <tamratt@who.int>
- Bryn Rhodes <bryn@alphora.com>

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 Breakout Session 2—Delving into Solutions, Needs, and Priorities for 2020

- **Technical** - facilitated by Carl Leitner and Carl Fourie
- **Community and Governance** – facilitated by Amanda BenDor, Digital Square, Partnerships and Community Engagement Manager and Michael Downey
- **Business Model and Sustainability** - facilitated by Skye Gilbert, Digital Square Executive Director, and Heath Arensen, Open Source Center - Digital Impact Alliance, Director of Business Planning)
- Each group will convene and dedicate time to outlining solutions to challenges and make a list of priorities for stakeholders and investors in 2020 and beyond. The groups will nominate someone to share a read-out in the subsequent session.

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