**Accelerator Discussion Frame**

**Accelerator 6. Data and Digital Health**

An unprecedented amount of data will be required to monitor global progress towards and ultimately achieve Sustainable Development Goal 3 (SDG3). Fortunately, we are in an era of technological innovation that makes it easier to collect, store, process, analyse, and use these data. Digital health technologies provide promising avenues for acceleration and innovation in service of achieving the 2030 SDG3 targets.

This paper is meant to encourage in-country and global discussion about key digital health and data use accelerators. At the end of the paper, we introduce a discussion framework that can guide governing bodies, teams, working groups, and passionate communities towards actionable next steps for (1) incorporating accelerators into current programs and (2) advocating for their uptake.

**A. Data quality and data use problems impede health and well-being**

Initially, we believe that new data accelerators will address the following three categories of problems, though a cascade of additional benefits may ensue:

- **Poor Information.** Most health professionals serving low- and middle-income populations struggle with untimely, inaccurate, and incomplete information. Competing priorities, burdensome documentation requirements, and rarely-used outputs result in low motivation to collect data. Health managers struggle with poor data to understand service availability and quality and are obligated to make resource allocation decisions with limited insight.
- **Shifting disease burden.** The global burden of disease is increasingly shifting from infectious diseases to chronic conditions. The prevention and treatment of these conditions often require both deeper engagement from health professionals and direct interventions to change behaviour of patients. At the same time, the unmet need for health services is reaching unprecedented levels, with a net shortage of 15 million health workers predicted by 2030.
- **Data privacy and security.** Individual-level, digitized information is increasingly necessary for delivering best-in-class medical interventions (e.g., precision medicine), addressing barriers to receiving quality health services, and monitoring progress towards the SDGs. However, millions of existing digital identities are vulnerable to fraud and public exposure of personal information because they are stored in unsecured systems. In addition, billions of people do not have a digital identity and are therefore not represented in the electronic data systems used to monitor and collect data. Health workers, facilities, commodities, even health services themselves, need to be uniquely and securely identified, within a system that

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supports interoperability and effective data sharing and use, to ensure equitable access to best-in-class medical interventions.

B. A framework for identifying data and digital health accelerators

Given the extremely fast innovation cycles in the digital health space, comprehensive selection criteria are essential to identifying the most promising accelerators critical to advancing the best solutions. These criteria should fall within a framework that considers fit with country needs, technology maturity, and operating model maturity, and (see Figure 1).

**Figure 1: Framework for identifying data and digital health accelerators**

- Advances or shifts theory of change
- Meets normative digital functional requirements
- Accelerates progress equitably
- Gains acceptance of a spectrum of users
- Operational in varied policy environments
- Financially self-sustaining in high and low-income markets
- Able to scale and accelerate SDG3 progress
- Facilitates information flow with key health information systems
- Protects and secures confidential information
- Support large-scale efforts with minimal adaptation

**Fit with member country needs**: Data and digital health accelerators must be responsive to country needs.

- Degree to which the technology either advances movement through an established theory of change to reach [SDG3 targets](https://www.un.org/sustainabledevelopment/sustainable-development-goals/) or catalyses a paradigm shift into a new theory of change.
- Degree to which the technology meets the digital functional requirements laid out in the World Health Organization’s [Classification of Digital Health Interventions](https://apps.who.int/iris/bitstream/handle/10665/65849/9789241549383-eng.pdf).

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• Degree to which the technology can accelerate progress in an equitable way, reaching even individuals with limited access to health services and/or information technology.

**Maturity of the technology:** Data and digital health accelerators must meet certain maturity criteria to encourage full-scale implementation and sustainability.

• Degree to which the technology facilitates information flow with other key health information systems.
• Degree to which the technology protects and secures the confidential information in its system.
• Degree to which the technology can support large-scale efforts (e.g., millions of users; billions of transactions) with minimal adaptation.

**Maturity of the operating model:** Data and digital health accelerators must move from single-application interventions to a more holistic digital infrastructure in order to be applied across countries and health areas.

• Location of the technology on Roger’s adoption curve, and in particular, whether it has successfully crossed the chasm gaining the acceptance among a spectrum of users.
• Degree to which the technology can operate in volatile policy environments.
• Degree to which the technology is financially self-sustaining in both high and low-income markets.
• Location of the technology along the Gartner’s hype curve and implications for its future scale and ability to accelerate progress towards achieving SDG3.

C. How data and digital health accelerators drive integrated service delivery

Based on a review of emerging technologies and how they performed against this framework, we have identified the following initial set of data and digital health accelerators which we think have the greatest potential to advance integrated service delivery while addressing the three identified problem areas:

• **Cloud-based visual analytics** transmit the right health information to the right decision-makers at the right time, while delivering insightful and useful data representations. This type of analysis strengthens the entire data management pipeline, enabling a continuous, evidence-based approach to clinical and operational decisions. For example, by removing redundant data entry across supply chain and clinical records, digital data collection can save days’ worth of health worker time, collapsing the steps between data collection, analysis, and use. The processing power accessible through cloud-based models, along with well-defined data standards and interoperability across systems, allows data to be analysed quickly and affordably.

• **Automation** relieves overburdened health workers, so they can provide high-quality clinical care, reduce disease and disability, and empower communities and individuals to minimize

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their own health risks. Artificial intelligence (AI) and machine learning can help reduce the need for services and the potential for human error, while dramatically increasing health workforce productivity. AI-enabled chatbots and personalized health information are increasingly used to help patients navigate the health system, manage treatment, and assist in emergency or first aid situations. Applying machine learning to health datasets allows some non-clinical tasks, such as supply chain management, to be largely automated. AI and machine learning also have the potential to transform the way global policy-makers assess survey and routine data, allowing algorithms to test previously unexplored hypotheses. For medical conditions that are under-researched and poorly understood, exploratory machine learning may drive breakthroughs in prevention, diagnosis, and treatment.

- **Social media nudges** help build trust and increase use of new operational and clinical practices, such as AI-derived demand forecasts, by building communities of professionals who learn and discuss new health care trends, test new approaches, and exchange best practices. Nudge theory uses positive reinforcement to influence the behaviour and decision-making, helping groups and individuals understand health risks and strengthening motivation to engage in healthy behaviours. Digital interactions between people, rather than person-to-AI, adds a powerful, softer touch and embedding AI-informed approaches into human networks brings the best of both worlds to influencing healthy behaviours.

- **Secure digital identities** protect individuals while allowing their data to improve their own clinical treatment, and potentially the treatment of others. They allow health workers and their supervisors to review transaction histories and compare the effectiveness of different techniques over time. Secure digital identities also help frontier medical interventions reach lower-income populations more quickly and allow individuals to contribute their health data to both the health system and medical research without sacrificing privacy. De-identified, individual-level data supports frontier medical research in genomics and precision medicine. They also help the global health community better understand global and local needs, disease trends, and causes of death over time.

- **Unique identifiers** are needed by health workers, facilities, commodities, and health services to support interoperability and effective data exchange in order to maximize the value of digital health systems. Several countries have established health facility registries to ensure an accurate and canonical list of facilities is available for reference by digital health applications. GS1-standard barcodes and other approaches, including blockchain technologies, are being used to uniquely identify and track health commodities as they move through the health system, with the ultimate vision to track an individual vaccine vial from manufacture all the way to dispensation.

- **Interoperability and common data standards** allow information to flow seamlessly across technologies, creating new, combinatorial innovations. Data standards ensure that the information, once exchanged, is sufficiently homogenous, so that it can be analysed and visualized. When interoperability and data standards are in place, data and digital health technologies can have an exponential impact on health system effectiveness.

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Ultimately, these data accelerators extend the reach of the health workforce, affordably address non-communicable diseases, encourage healthy behaviours, and help health workers more holistically understand the communities and individuals they serve.

Conclusion and Next Steps

As illustrated in the following supply chain management case study, the potential impact of the data and digital health accelerators can have a transformative impact across all domains, clinical and operational. However, the impact of these accelerators depends far less on the sophistication of the technology, and far more on the presence and strength of seven enabling eHealth components, including leadership & governance, infrastructure and workforce capacity. Without a digitally literate workforce, clear legislation protecting the rights of digital users and their data, governing bodies that have a mandate to respond to digital data, and reliable power and network connectivity, the accelerators lose their influence and relevance. Strong system fundamentals provide a foundation for transformative digital and data accelerators; the value of investing in those fundamentals cannot be underestimated.

We encourage conversation around this paper, using the following discussion frame to guide the conversation. Your input will help the SDG3 Action Plan Working Group prioritize and focus their efforts on areas that will be most meaningful and impactful for country member states and will be used to develop a work plan. The outputs of this discussion are not meant to influence funding allocations, but rather to highlight areas where our collective action can most accelerate our ability to achieve the SDG3 2030 targets.

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Discussion frame: New uses of data to accelerate health and well-being

Setup
- Schedule a two-hour session, ideally within an existing convening body
- Send this document as an optional pre-read
- Identify a facilitator and a notetaker

Facilitation guide for discussion

Minutes 0-10: Introduce participants and share objectives for the discussion. Objectives may include:
- Compile input and feedback on the new data use accelerators
- Identify 3-5 tactical next steps for incorporating accelerators into the convening body’s current programs
- Identify 3-5 tactical next steps for promoting the uptake of these accelerators beyond the convening body

Minutes 10-30: Silently review SECTION A of this document, then discuss:
⇒ What health system challenges do you think new uses of data can best help resolve?

Minutes 30-50: Silently review SECTION B of this document, then discuss:
⇒ In general, what proposed or new criteria would be especially helpful for prioritizing which digital health technologies and data accelerators are a good fit for a given context?
⇒ For the specific context in which this convening body operates, which criteria are most important?

Minutes 50-70: Silently review SECTION C of this document, then discuss:
⇒ Which accelerators do you think will have the most impact?
⇒ Which accelerators are currently being used or considered for use in your country?
⇒ Which partners have done the most to incorporate accelerators? How could their efforts be extended?

Minutes 70-90: Silently review the CASE STUDY and do an individual reflection on the following:
⇒ What are 3-5 ideas for how one, or a suite, of accelerators could help this convening body in its work?
⇒ Pick one idea. For this idea, what are three achievable next steps that this convening body could take in the next 3 months?
⇒ Who are 3-4 stakeholders, outside the convening body, that will play an important role in ensuring accelerators scale and drive to impact?
⇒ Pick one stakeholder. For this stakeholder, what are two achievable next steps that this convening body could take to advocate for that stakeholder to play the important role?

Minutes 90-110: Participants share their reflections. Facilitator looks for themes and distils reflections into representative set of next steps for implementation and advocacy.

Minutes 110-120: Facilitator shares early distillation for feedback, and gains commitment of participants to hold to next steps

Follow-up
Note-taker shares meeting notes with the participants

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CASE STUDY: How data and digital health accelerators are amplified through interoperability and common data standards when applied to supply-chain management

Health outcomes rely on the six 'rights' of supply-chain management: the right product, reaching the right place at the right time, in the right quantity and condition, at the right cost. Functional supply chain systems deliver products to end users, but many countries face fluctuating and mostly insufficient domestic resources for the procurement of essential health commodities. Manufacturers and health workers require end-to-end visibility into supply chains to improve national forecasting and procurement plans. Each of the accelerators identified above has a role in advancing supply chain management:

- **Cloud-based visual analytics**, via a Global Visibility Analytics Network (G-VAN) improve visibility into the supply network, from manufacturers to the point at which health products are administered.
- **Automation** helps to identify patterns in supply chain data and the most influential factors to the success of supply networks. These relationships feed into increasingly accurate and robust demand forecasting models and decision aids for health workers.
- **Social media nudges** help build trust and increase use of new supply chain practices, such as AI-derived demand forecasts, by building communities of professionals who learn and discuss new supply chain trends, test new approaches, and exchange best practices.
- **Secure digital identities** allow health workers and their supervisors to review transaction histories and compare the effectiveness of different techniques over time. Digital identities also provide supervisors with evidence to build an even more merit-based rewards and career progression system.
- **Unique identifiers** enables supply chain professionals accurately track the flow of goods throughout the health system, which helps minimize product wastage, ensures adequate provision of supplies at health facilities, and increases overall safety by facilitating easy product recalls.
- **Interoperability and common data standards** allow supply chain professionals to exchange information across systems, applications and devices. This information-sharing ensures, for example, that CRVS data informs supply chain demand forecasting for infant immunizations, or that commodity wastage rates contribute to health manager dashboards. Insights informed by holistic datasets are stronger and lead to higher-impactful decisions and actions in the supply chain and beyond.

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Potential partners

Helpful references

- UN agency publications
  - https://www.accessmod.org/

- Private sector publications

- Academic Publications

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- **Non-profit and Civil Society publications**
  - [https://medium.com/@marcoannunziata/how-digital-industry-can-solve-the-sustainable-development-goals-5ac70f4298a7](https://medium.com/@marcoannunziata/how-digital-industry-can-solve-the-sustainable-development-goals-5ac70f4298a7)