Catalysing Digital Health and AI For Health Innovation

Second report based on meetings of the

Global Health Policy Partnership

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Abbreviations

AI: Artificial Intelligence

DHI: Digital Health Innovations

DHIS: The District Health Information Software

ITU/WHO WG-CO: International Telecommunication Union/World Health Organisation Working Group Collaborations and Outreach

LMICs: lower-middle-income countries

QALYs: Quality Adjusted Life Years

RWD: Real-World Data

RWE: Real-World Evidence

USAID: US Agency for International Development

WHIG: World Health Organisation Health Innovation Group

WHO: World Health Organisation

Definitions

Digitalisation: the transfer of delivery in-person services to delivery via digital platforms.

Hyperintergation: the increasing complexities in interactions between and across digital systems.

Platformisation: the development of several platforms to deliver various services.

Real-World Data: observational data obtained outside the context of randomised controlled trials and generated during routine clinical practice.

Real-World Evidence: evidence obtained from real-world data.

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Section 1- Introduction

This section will introduce the digital health and AI for health research groups from which the report is based and then set the scene for catalysing digital health innovation.

1.1 Context

The Global Health Strategy Group for Digital Health and AI for Health, a University of Oxford initiative, was created to bring together digital health and AI for health experts and to leverage the skills and enthusiasm found in the global north and global South. In spring 2022, the group was merged into the new Working Group Collaborations and Outreach (WG-CO) of the ITU/WHO Focus Group on Artificial Intelligence for Health (FG-AI4H)

The content of two meetings shapes this report. The Global Health Strategy Group hosted the earlier meeting for Digital Health and AI for Health, and ITU/WHO FG-CO hosted the later session. Both heard from a selection of members about their work. These meetings focused on methods for upscaling digital tools for health and catalysing digital health innovation globally while spotlighting current work done by real-world implementers in the digital health and AI for health space. This report is based on external literature reviews and emerging discussions during the meetings, from speaker presentations, feedback and insights among group members.

1.2 Background

The field of digital health is said to be broad, with varied descriptions for the term "digital health." According to the US Agency for International Development (USAID), Digital Health is "the systematic application of information and communications technologies, computer science, and data to support informed decision-making by individuals, the health workforce, and health institutions, to strengthen resilience to disease and improve health and wellness for all."[1] Generally, it refers to the design and implementation of tools such as electronic health (eHealth), mobile health (mHealth), artificial intelligence (AI) and big data technologies to tackle healthcare challenges. The use of digital approaches to address global health challenges has exponentially increased.[2]

The Oxford English Dictionary defines innovation as "the alteration of what is established by introducing new elements or forms." And according to the World Health Organisation Health Innovation Group (WHIG), Health Innovation; "identifies improved health policies, systems, products, and services and delivery methods", "responds to unmet public health needs by creating new ways of thinking and learning", and "aims to add value in the form of improved efficiency, effectiveness, quality, sustainability and/or affordability of healthcare."[3] Although there is a significant increase in the use of digital tools to deliver healthcare solutions, catalysing innovation of these technologies will require robust and improved approaches that ensure that technologies strengthen health systems and address the policy needs of ever-evolving and complex healthcare sectors around the world.[4,5,6]

The field of digital health has received significant attention over the last decade, which increased even further with the arrival of the COVID-19 pandemic.[7] Researchers are calling for more robust research in digital health tools to promote evidence-based decision making. International and national policymakers and implementers are calling for more robust governance structures,

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[1] US Agency for International Development (USAID). A Vision for Action in Digital Health 2020–2024: Accelerating the Journey to Self-Reliance Through Strategic Investments in Digital Technologies. Washington, DC: USAID; 2020.
https://www.usaid.gov/sites/default/files/documents/USAID-A-Digital-Health-Vision-for-Action-v10.28_FINAL_508.pdf

[2] Nigel Cory and Philip Stevens | May 2020. Information Technology and Innovation Foundation-Building a Global Framework for Digital Health Services in the Era of COVID-19
https://itif.org/publications/2020/05/26/building-global-framework-digital-health-services-era-covid-19

3 World Health Organisation Health Innovation Group (WHIG)
https://www.who.int/phi/2016_05health_innovation-brochure.pdf

[4] Bhavnani SP, Parakh K, Atreja A, Druz R, et al Roadmap for Innovation—ACC Health Policy Statement on Healthcare Transformation in the Era of Digital Health, Big Data, and Precision Health. 2017. Journal of the American College of Cardiology, Volume 70, Issue 21, 2017, Pages 2696-2718, ISSN 0735-1097, https://doi.org/10.1016/j.jacc.2017.10.018.

[5] OECD-Digital Health
https://www.oecd.org/health/digital-health.htm

[6] World Health Organization. (2021). Global strategy on digital health 2020-2025
https://apps.who.int/iris/bitstream/handle/10665/344249/9789240020924-eng.pdf?sequence=1&isAllowed=y

[7] Nigel Cory and Philip Stevens | May 2020. Information Technology and Innovation Foundation-Building a Global Framework for Digital Health Services in the Era of COVID-19
https://itif.org/publications/2020/05/26/building-global-framework-digital-health-services-era-covid-19

investments, and collaborations to promote regional and global digital health interventions.[6] This potential for greater human and non-human investment in digital health tools highlights a need to explore critical approaches for catalysing innovation in digital health and AI for health.

Despite these projected advantages of digital solutions in healthcare, digital health technologies will not address all existing challenges in the healthcare sector. Instead of seeing digital tools as a silver bullet, existing gaps in the broader health systems must be identified, and areas, where digital tools can be utilised to support and cover those gaps should be explored.[8]

With such considerations in mind, this report discusses approaches required to catalyse digital health innovation discussed during these two meetings while highlighting essential case studies from Africa and Asia.

[8] Tom Neumark and Ruth J. Prince Digital Health in East Africa: Innovation, Experimentation and the Market 2021 University of Oslo

Section 2: Key approaches for catalysing digital health innovation

This section discusses three interrelated multisectoral and collaborative strategies for catalysing digital health and AI innovation for health while spotlighting real-world case study examples.

2.1 Investments

The current and projected explosion of the use of various digital tools in improving healthcare outcomes globally has indicated the need for increasing sustainable resource allocation and investment models. Although significant progress has been made in financing digital health innovations by venture capitals or by grant funds from foreign aid, these routes have led to the implementation of verticalised digital tools which operate in siloes. This siloed operation leads to a growing concern about unsustainable digital tools, poor integration across tools and providers, and the commercialisation of innovation, leading to a greater focus on profit-driven investments at the detriment of investments driven by global good and social equity.[6-8,9]

To tackle these challenges, financing digital solutions requires a systemic approach guided by national-level investments to guarantee that the tools respond to context-specific healthcare problems and can be integrated into existing health systems. Context-specific tools tailored to fit the population's needs are more likely to be successfully scaled up. Further, national government investments will ensure that the right stakeholders are engaged effectively and that end-users' feedback is obtained by leveraging existing health system structures. These highlight a need for greater national-level investment in digital tools supported by core partnerships formed with all stakeholders to create a favourable environment that encourages data and resource sharing, interoperability and sustainability and curbs duplication of services. [9,10,11]

Further, there is a need to re-frame the existing public-private global financial models. Investment models should encourage financing grounded in ethical concepts of beneficence, non-maleficence, equity, and social justice.[6-8] These models should also extend beyond private donor funding, which

[9] Mckinsey-Unlocking digital healthcare in lower- and middle-income countries November 2021
https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/unlocking-digital-healthcare-in-lower-and-middle-income-countries
[10] United States Agency for International Development's (USAID) Bureau for Global Health's flagship Maternal and Child Survival Program (MCSP) -Digital Health Investment Review Tool December 2018.
https://www.mcsprogram.org/wp-content/uploads/dlm_uploads/2018/12/DHIRT-Tool-FILLABLE-4.3.19.pdf
[11] Global Development Incubator-The State of Digital Health 2019. April 2019
https://www.digitalhealthindex.org/stateofdigitalhealth19

is mainly capped or limited to a time frame, and explore other funding options such as user-or insurance-dependent mechanisms, which solutions can transition to after exhaustion of seed funding to ensure the sustainability of these solutions.[12]

Sustainability can also be assured by building capacities and improving access to resources and expertise to encourage partnerships. Building capacities through training programmes such as accelerators and incubators designed to support digital innovators in developing scalable and sustainable digital health solutions have been shown to be indispensable to innovation as they strengthen innovative business opportunities for all stakeholders[13].

Case Study: Villgro Africa

Founded in 2015, Over the last six years, Villgro Africa has supported over 40 digital health innovators and invested more than $1.3 million in seed funding in implementers that have gone on to unlock over $18 million in follow on funding and reaching over 1.8 million lives in East Africa. Villgro Africa is catalysing innovation by providing thematic innovation calls for priority areas, context-specific rigorous selection process, technical support, market-entry support and seed funding to digital health innovators in Africa. In 2021, Villgro Africa made a digital innovation call for innovators in Africa, they received 187 applications, and 162 did not meet the pre-determined selection criteria. Of the 25 digital selected solutions, they performed rapid diligence and assessed the innovations for potential viability and impact. This led to the selection and training of 12 innovators for the final pitch. Also, Villgro Africa is working to create a digital ecosystem through partnerships with academia, government, and the private sector that encourages innovation and sustainability. A beneficiary of the Villgro Africa innovation call is Streamline Health Tech, an IT company that is improving patient outcomes and affordability of quality healthcare in Uganda. Streamline Health Tech achieves its aim using various solutions. The healthcare information system platform (HMIS) is a solution that is accessible using any device. It delivers patients' clinical, administrative, and financial management throughout their healthcare system journey from first contact to discharge. So far, Stream HMIS is being used by 34 hospitals in Uganda, with over 500,000 patient records and 850,000 patient visits. Also, over 2,500 clinical and administrative staff use the platform daily. Streamline Ubuntu is a healthcare insurance solution that utilises USSD to deliver community health insurance to small communities and therefore improve access to quality healthcare. The data from Ubuntu are also used for forecasting, disease surveillance and informing decisions and planning at the healthcare centres. So far, three hospitals have already signed up to Streamline Ubuntu for community health insurance with over 52,000 insurance beneficiaries. Streamline is working with other partners to facilitate scaling up across Africa.

Excerpts from ITU/WHO FG-CO Meeting on Catalysing Innovation February 2022
Link

[12] Exemplars in Global Health- Overview Digital Health Tools
Available at: https://www.exemplars.health/emerging-topics/epidemic-preparedness-and-response/digital-health-tools
Accessed 14th April 2022

[13] Mckinsey-Unlocking digital healthcare in lower- and middle-income countries November 2021
https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/unlocking-digital-healthcare-in-lower-and-middle-income-countries

Case Study: Wadhwani AI - AI for Social Impact

An India-based non-profit institute building AI-based solutions to achieve social impact at scale to benefit underserved communities across lower-middle-income countries. Their goal is to bring about sustainable and large-scale social impact through AI.

Wadhwani AI is catalysing innovation by improving AI Readiness, which is an organisation's ability to create and use AI to achieve more significant benefits than traditional methods. By building capacities and enabling environments, Wadhwani AI supports organisations and governments to use AI effectively to enhance their programmes and operations. Wadhwani AI also catalyses innovation by developing various digital solutions to health and agricultural problems. Some of the areas being addressed include infectious diseases, pandemic response and preparedness and maternal, newborn and child health. The typical innovation roadmap commences with a formal assessment of the opportunity, planning and resource allocation, to the development and testing of the solution, coupled with risk identification and management. The solution is then deployed, and errors are corrected before the final stage of scaling up.

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2.2 Research and Evaluation

With the continuous digitalisation of healthcare, accelerating the development of evidence-based, innovative methods to deliver digital health interventions has become necessary.[4,14] Robust research is essential for policymaking and designing contextualised tools that strengthen health systems and patient outcomes. However, most existing tools are poorly researched, fail to go beyond pilot stages, are not contextualised, and are unadoptable by existing healthcare practitioners and systems.[4,15] Yet, even as these digital health innovation pilots largely fail to scale up, they are being used to develop policies, creating the feeling of "Pilotitis", which is the frustration of healthcare practitioners at the continuous emphasis placed on demonstrating positive outcomes from pilot interventions that target small and unrepresentative populations.[16] The development and upscaling of new digital tools should be informed by context and designed from the ground up to better address the needs of its end-users. Innovators must recognise that "use and development are twin processes and that they unfold in real-time, mutually shaping each other as learning by using expands or narrows the technology's scope of application."[17] International and national level policymakers must make decisions grounded on the evidence generated from robust research. For example, in Germany, guided by evidence, the Digital

[14] Jocelyn Tseng, Sonia Samagh, Donna Fraser, Adam B. Landman,
Catalyzing healthcare transformation with digital health: Performance indicators and lessons learned from a Digital Health Innovation Group, Healthcare, Volume 6, Issue 2, 2018, Pages 150-155, ISSN 2213-0 https://doi.org/10.1016/j.hjdsi.2017.09.003

[15] Torous J, Roberts LW. Needed innovation in digital health and smartphone applications for mental health: transparency and trust. JAMA Psychiatry. 2017;74(5):437–438.

[16] Huang, F., Blaschke, S. & Lucas, H. Beyond pilotitis: taking digital health interventions to the national level in China and Uganda. Global Health **13,** 49 (2017). https://doi.org/10.1186/s12992-017-0275-z

[17] Consoli D, Mina A. An evolutionary perspective on health innovation systems. J Evol Econ. 2009;19(2):297–319.

Healthcare Act was passed in 2019 to catalyse digital health innovation. This act created a regulatory "Fast-Track" pathway from invention to scaling up for digital health innovations in the German market that meet the specified standard of lower-risk medical devices (safety, functionality, quality, data protection, data security, and interoperability) and are primarily used by patients rather than physicians.[18] This shows how robust research, strong government leadership, and collaboration can catalyse digital health innovation.

Furthermore, digital tools hold significant potential in supporting the generation of evidence-based, innovative solutions. The US Food and Drug Administration defines Real World Data (RWD) as "data relating to patient health status and/or the delivery of health care routinely collected from a variety of sources" and defines Real World Evidence (RWE) as "the clinical evidence regarding the usage and potential benefits or risks of a medical product derived from analysis of RWD."[19] Therefore, RWE is generated from the analysis of RWD. And since digital tools can efficiently collect RWD, digital tools are critical to generating RWE that informs future patient care and resource allocation. They can also support the baseline data collection necessary for research and decision-making processes for innovation, design, validation and scaling up. This feature of digital tools makes them almost indispensable to catalysing innovation and research while also exposing them to challenges in data governance and privacy and operational barriers such as burden to patients and standardisation of data collection tools. These, therefore, highlight a need to underscore that research and innovations of digital tools must be underpinned by international standards for research, which is critical to establishing the generation of safe, equitable and standardised innovation and research practices, which can yield potentially scalable innovation, and generalisable or transferable evidence.[4,20]

[18] Stern AD, Brönneke J, Debatin JF, Hagen J, et al . Advancing digital health applications: priorities for innovation in real-world evidence generation. Lancet Digit Health. 2022 Mar;4(3):e200-e206. doi: 10.1016/S2589-7500(21)00292-2. PMID: 35216754

19 US Food and Drug Administration. Real-world evidence. July 16, 2021.
Real-World Evidence | FDA (accessed 14th April, 2021).

[20] Big Tech's latest moves raise health privacy fears. December 2020
Available at: https://www.ft.com/content/01d4452c-03e2-4b44-bf78-b017e66775f1
Accessed April 14th 2022

Case study: IBM Research Africa

A current interest for IBM research Africa is to support the use of trustworthy and evidence-based AI for decision making. According to the evidence, for AI to be considered Trustworthy, it has to possess some of the following critical components. Explainable, as is usually a result of understanding [???]. Also, there should be fairness, which will ensure that the necessary monitoring and safeguards are in place to mitigate bias and promote equitable treatment for all [again. let us discuss].

Further, trustworthy AI at scale guards against malicious threats and potential incursions to keep systems healthy. Also, transparency reinforces trust and sharing information with stakeholders of varying roles engenders further trust. Finally, AI systems should safeguard data from training to production and governance through the entire lifecycle. [this needs to be a list.. and I am not quite sure what much of it means...perahps we can discuss... also do they not have some nice slide/diagran or otehr?] To improve the use of trustworthy AI, IBM Research Africa catalyses innovation by using automated stratification that automatically analyses large data sets, e.g. DHIS, to detect potential divergence in the particular subgroup in a given population.

Automated stratification detects and characterises bias in data and machine learning models to enhance accurate [???] the identification of at-risk populations, improve data quality for decision-making, improve treatment quality and detect threats. For example, automated stratification was used to identify a vulnerable subgroup of mothers at the highest risk of neonatal death in the Better Birth Study conducted by the world health organisation (WHO) to tackle maternal and neonatal deaths. Also, Automated Stratification can be used to detect changes in data relationships that occur over time (Temporal/Concept Drift) and better target resources. This was utilised in a study conducted to detect missed populations [???] the type of women and families driving the overall decrease in child mortality rates observed in the past decade and the potential groups of women and families left behind.

Further, IBM Research Africa developed the AI fairness 360º, an open-source toolkit designed to support the examination, reporting and mitigation of bias in machine learning models throughout the AI application lifecycle. Utilising data-driven AI techniques to identify changing landscapes of key global health areas to better guide resource allocation to at-risk populations. They are also collaborating with implementers and practitioners across regions and platforms to promote the use of trustworthy AI in health. [this is a little hard to follow.... and maybe needs more definitions and diagrams?]

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There is a paucity of economic evaluation of digital health tools with little evidence of the cost savings potential of these tools.[21] The current promise of digital health tools leading to increased access to cost-effective healthcare services assumes that the degree of utilisation of healthcare services will remain unchanged. This poorly reflects the on-the-ground healthcare service delivery experience, as a reduction in cost usually increases healthcare service utilisation. And "given that total expenditure equals the quantity demanded multiplied by its price, the introduction of low-price technologies might lead to an overall rise in net expenditure."[19,22]

Several challenges hamper robust economic evaluation of digital tools, such as the field's novelty, the attendant lack of data required to perform robust economic evaluations, the ever-evolving and complex features of digital tools compared to medicines or treatments, and the non-healthcare

[21] Digital health and the elusive quest for cost savings. 2019 The Lancet Digital Health
Kazem Rahimi

[22] Gomes, M., Murray, E. & Raftery, J. Economic Evaluation of Digital Health Interventions: Methodological Issues and Recommendations for Practice. PharmacoEconomics **40,** 367–378 (2022). https://doi.org/10.1007/s40273-022-01130-0

impacts of digital tools illustrated in table 1. These highlight a critical need for the development of evaluations models and tools for digital health tools to accurately demonstrate that innovations are, indeed, cost-effective.

	Pharmaceuticals	Medical devices	DHIs	Implications to economic evaluation
Comparator	Usually a well-defined comparator, e.g. placebo	Usually a well-defined comparator, e.g. competing device	Often a combination of alternative treatment options	To consider both digital and non-digital comparators and whether DHI replaces or complements existing technology
Product evolvement	Fixed	Evolves gradually with product modification, and innovation	Evolves fast with user feedback and requires frequent updates	To account for the rapid evolution of DHI and its impacts on costs and benefits, and the timing of the analysis
User involvement	Generally limited to compliance	Interaction between user (e.g. surgeon) and device may or may not be required	Active user input (patient or doctor) always required for DHI to be used as intended	To consider user time (costs) and user experience (benefits)
Intervention cost	Fixed unit price, reflecting both fixed and variable costs	Fixed unit price, but dynamic pricing due to weaker regulation than for pharmaceuticals	DHI is often provided at scale. The unit price is the marginal cost, which tends to zero	Development costs not always included in cost analysis. Mean cost per user should be based on the eligible population and expected uptake rates
Benefit assessment	Most benefits reflected by individual health changes	Non-health benefits limited to some products, such as diagnostic devices	DHIs typically lead to diffused health and non-health changes	To include non-health benefits, both to patients and other parties (e.g. health professionals, carers)
Non-health care impacts	Often low; limited to some disease settings, e.g. mental health	Often low, limited to some interventions, e.g. cardiac devices	Often significant, such as productivity impacts, irrespective of the setting	To consider all relevant impacts outside the health care sector as part of an 'impact inventory'
Economic analysis	Cost per QALY assessments usually appropriate	Same as pharmaceuticals	Cost per QALY unlikely to reflect broad range of health and non-health impacts	Cost-consequence analysis is likely to be most suitable and in line with an impact inventory

Table 1: Challenges of researching digital health tools compared to other interventions.[21]

Overall, robust research will support the design and implementation of innovative, context-specific digital tools that are well evaluated to determine true cost-effectiveness, cost-utilisation, and cost-benefit. Research will also create robust, reproducible systems to move innovations from pilot to successful implementation designed in partnership with all stakeholders, including the needs of end-users. Evidence-based pilots will offer detailed and precise measures of success and how the innovation will be integrated, address existing gaps/priority areas and directly enhance health systems function.[13,23]

2.3 Digital Ecosystems

A digital ecosystem is a network of digital communities consisting of interconnected, interrelated and interdependent digital species, including stakeholders, institutions and digital devices situated in a digital environment that interact as a functional unit and are linked together through actions, information and transaction flows.[24] Current digital tools exist mostly in siloes with little to no

[23] Villalobos Dintrans, P., Bossert, T.J., Sherry, J. et al. A synthesis of implementation science frameworks and application to global health gaps. glob health res policy **4,** 25 (2019). https://doi.org/10.1186/s41256-019-0115-1

[24] Gloria Ejehiohen Iyawa, Marlien Herselman, Adele Botha,
Digital Health Innovation Ecosystems: From Systematic Literature Review to Conceptual Framework,
Procedia Computer Science, Volume 100, 2016, Pages 244-252, ISSN 1877-0509,
https://doi.org/10.1016/j.procs.2016.09.149.

integration due to deeply complex systems that stifle any attempt at integration, partnerships and interoperability.[9] These highlight an urgent need to strengthen digital ecosystems to streamline data sharing and integration for accessible communication and partnerships between practitioners.

One major contributor to this poor integration of digital tools is the increasing complexities in interactions between and across systems (known as "hyperintergation"). Digital innovations have evolved from the simple transfer of utilities to digital platforms (known as "digitalisation") to the development of several platforms to address various needs ("platformisation") and the centralisation of technological power among the very few providers worldwide (known as "central digital hubs") (figure 1).[25]

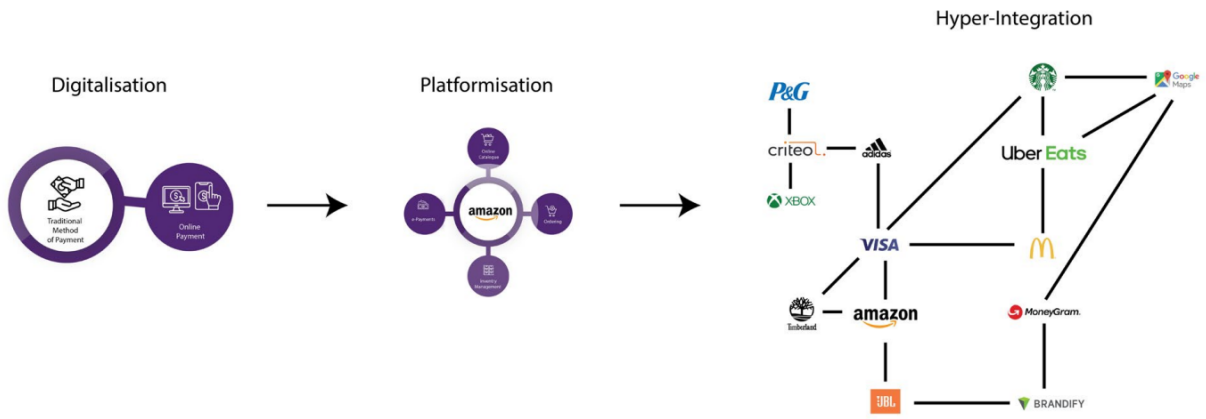

Figure 1: Hyperintegration of digital technologies[24]

Previously, the connections between these platforms and specific partner central hubs were simple connections between algorithms and the data sources of different platforms. These connections have evolved into complex systems and interactions that constrain partnerships in digital innovations, manifesting as; extensive heterogeneity across government, private and civic society data systems that make it challenging to share information and make it difficult to access data. Furthermore, navigating existing legal and political frameworks that permit access and level of access to data is often beyond the capacity of the project developers to manoeuvre. These complexities delay the delivery of digital solutions, as manoeuvring them requires extensive partnerships across platforms, providers, end-users and industries, leading to significant delays in collaborations for digital innovations and the development of digital technologies.[24]

[25] Bright Simons Centre for Global Development - A Farewell to Disruption in a Post Platform World. December 2019. https://www.cgdev.org/sites/default/files/farewell-disruption-post-platform-world.pdf

A fundamental approach to tackling these existing complexities is through transmediation, which encourages creating digital ecosystems and partnerships, and utilises a tri-pronged system to support that digital health innovation informed by multisectoral input (public, private and civil society).[24] Catalysing digital health and AI for health innovation, therefore, requires solid national digital ecosystems that create favourable environments for multidisciplinary and interdisciplinary partnerships across various stakeholders, including innovators, researchers, healthcare managers, medical personnel, policymakers, private organisations, civil society organisations and patients.[9,26,27] Research conducted by Mckinsey in 2019 highlights approaches which countries can utilise to evaluate their baseline state of digital tools using six enablers. And they underscore that government-level leadership and governance is, in fact, the most important enabler for catalysing immediate, mid and long-term digital health innovation (figure 2).[9]

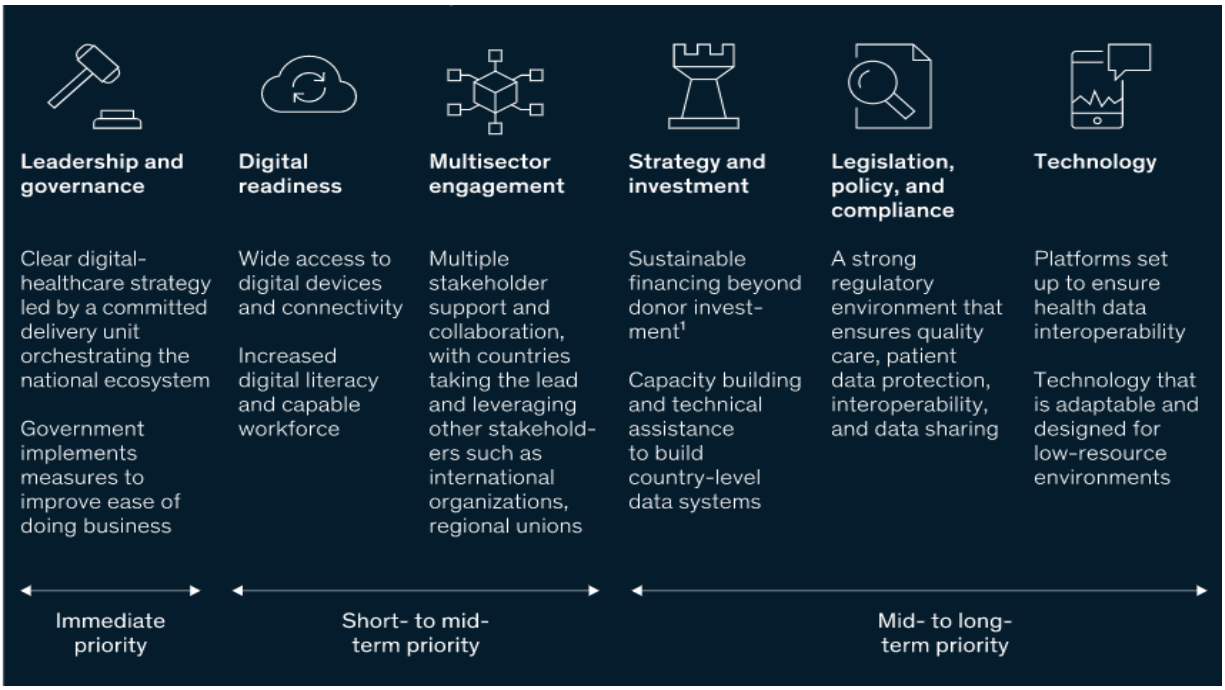

Figure 2: Enablers of digital innovation[9]

Furthermore, creating partnerships across regions will develop an ecosystem that encourages innovation across sectors, improves access and optimisation of resources, and could potentially establish avenues to develop digital tools with change management systems that allow easy adaptability.[9]

[26] WHO Global strategy on digital health 2020-2025 - Digital Technologies - Shaping the Future of Global Health https://apps.who.int/iris/bitstream/handle/10665/344249/9789240020924-eng.pdf
[27] Mckinsey- Healthtech in the fast lane: What is fueling investor excitement? December 2020 Available at: https://www.mckinsey.com/industries/life-sciences/our-insights/healthtech-in-the-fast-lane-what-is-fueling-investor-excitement Accessed April 14th 2022

Case Study: Afghanistan Experiencing Telemedicine Transformation

In Afghanistan, the over 2-decade conflict has left it mainly dependent on foreign aid, and the recent withdrawal of international support from the UK and US has further disrupted access to services in the health and education sectors. The use of telemedicine services with support from neighbouring countries like Pakistan, Tajikistan and the Kyrgyzstan Republic, funded by international aid, has been critical to delivering health services safely in Afghanistan, amid the worsened conflict.

Several partners including The Aga Khan University Hospital, the Government of Afghanistan, Bamyan Provincial Hospital, Roshan and French Medical Institute for Children, Aga Khan Health Services are working together and adapting to deliver telemedicine services in Afghanistan.

"Telemedicine has also been set up to conduct teleradiology, telepathology, and even hospital management. Since 2007, through Roshan's Telemedicine link, more than 15,000 patients have received the treatments they require, and nearly 6,000 teleconsultations and teleradiology sessions have been conducted. Alongside this, more than 4,000 doctors and health professionals in Afghanistan have been trained through telemedicine."

Excerpts from Afghanistan Experiencing Telemedicine Transformation, IoT Evolution Health News. by Ashmita Joshi January 2021. Accessed 14th April 2022.

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Digital ecosystems can create standardised pre, intra and post-pilot indicators and targets for digital health innovators and innovations, access to resources, and significant opportunities for multi-stakeholder engagement.[9,28] Digital ecosystem can lead to a reduction in the lead time from inception to pilot and implementation, development of standardised process indicators that will speed up innovation and enhanced standardised data collection, evaluation, and sharing across various organisations, which could significantly improve overall standardisation and interoperability of digital health innovations.[29] Digital ecosystems can also enhance partnerships and collaboration between researchers, innovators, private organisations, policymakers and funders, therefore enhancing the connection of the research industry, the use of evidence to make decisions, and the access to a wide range of resources.

[28] Stanford Medicine launches Center for Digital Health [Internet]. MobiHealthNews. 2017. Accessed 14th April 2022. Available at: ⟨http://www.mobihealthnews.com/ content/stanford-medicine-launches-center-digital-health⟩.

[29] Jocelyn Tseng, Sonia Samagh, Donna Fraser, Adam B. Landman, Catalyzing healthcare transformation with digital health: Performance indicators and lessons learned from a Digital Health Innovation Group, Healthcare, Volume 6, Issue 2, 2018, Pages 150-155, ISSN 2213-0764, https://doi.org/10.1016/j.hjdsi.2017.09.003.

Case Study: The Africa Oxford Health Innovation Platform

The Africa Oxford Health Innovation Platform (AfOx-HIP) is a multidisciplinary and interdisciplinary innovation hub designed to bridge the gap between research and industry and engage with varied expertise across Africa. The hub aims to leverage the University of Oxford's research and technical capacities to accelerate the development of digital solutions to tackle real-world healthcare sector challenges in Africa. The group provides support through the innovation and entrepreneurship scheme, a virtual training programme focused on building entrepreneurial capacities for African innovators working to address challenges in their various contexts. And this is followed by an Oxford-based fellowship offered to a sub-set of participants from the entrepreneurship scheme. The main goal of the fellowship is technical collaboration, where participants are connected to researchers, practitioners and resources. After these two stages, participants are connected to an alumni network that encourages future collaboration.

The rationale for setting up the group is underpinned by core existing gaps in the African context. The digital sector faces various challenges. However, the challenges peculiar to the African context are either that digital solutions are developed elsewhere and are therefore not context-specific, or that digital innovations are occurring at a slower pace than in other regions. Therefore, there is a need for catalysing the development of locally created context-specific digital solutions tailored to the needs of the African context. Furthermore, downstream bottlenecks in the process of taking digital tools from discovery to users exist mainly due to disjointed innovation ecosystems. In Africa, innovators are either trapped in the step that takes their tools from applied research to mass production mainly due to a lack of capabilities for transforming existing knowledge into new innovative configurations for new production systems or in the step that takes them from show to end-users mainly due to unfavourable market dynamics. If not addressed, this lack of favourable ecosystems for innovation could lead to disarticulating innovation capabilities**.** There is a need to encourage innovation with continuous learning, unlearning and relearning in the digital health space in Africa [is this not the same everywhere and in teh nature of digital tools that their exploration and evaluation and their implementation are wrapped up together a bit??]. AfOx-HIP is creating a new digital ecosystem that increases access to resources and technical capacities and provides approaches to rethinking start-up funding models to ensure equity and sustainability.

Excerpts from ITU/WHO FG-CO Meeting on Catalysing Innovation February 2022

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Section 3: Conclusion

Digital health tools are necessary to provide basic health care and achieve universal health coverage. They represent valuable tools that can be leveraged to address challenges such as lack of access to primary health care, maternal and child health services, and crisis response. Catalysing innovation of digital health tools needs first to be underpinned by strong national-level leadership and governance to encourage the creation of national ecosystems. These ecosystems could promote sustainability and partnerships based on national data protection and data security policies.

These ecosystems will also promote the use of context-specific and user-centred tools, responding to the needs of end-users.

Therefore, researchers should become activists for global digital health good; policymakers who have power and influence should make an active effort to use robust scientific evidence to inform policy decisions, and multidisciplinary communities that bring researchers and policymakers together should not only focus on developing collaborative ideas but also consider developing global platforms that create opportunities for integration and learning.