Digital Health Investment Review Tool

Photo credit: Karen Kasmauski/MCSP

BACKGROUND

Too often, digital health investments are made without the time or resources to develop a deep technical knowledge of the information and communications technologies (ICTs) behind them, or the ecosystem in which these technologies are used.

We use the term digital health to refer to all concepts and activities at the intersection of health and ICTs, including mobile health (mHealth), health information technology, electronic health records (EHRs), and telehealth, and encompassing three main functions:

- the delivery of health information, for health professionals and health consumers, through the Internet and telecommunications media,
- using ICTs to improve public health services (e.g., through the education and training of health workers), and
- using health information systems (HIS) to capture, store, manage or transmit information on patient health or health facility activities.

Digital technologies may be applied in one or more ways to address Health Systems Challenges, as described in the WHO Classification of Digital Health Interventions.

GOAL & OBJECTIVES

The **goal** of the Digital Health Investment Review Tool is to **provide high-level guidance based on widely-accepted best practice** such as the Principles for Digital Development and the Donor Investment Principles that can be used to support strategic investments in the use of digital technologies to support public and global health.

Specific **objectives** include developing language and tools that can help:

- **structure** requests for proposals (or other donor procurement mechanisms),
- **inform** grants and contracts language, and
- **support** informed advice / decision-making by procurement officers considering digital health proposals.

The **intent** is for this work to be undertaken in an **agile and iterative manner**, with frequent focus groups and product testing with the intended users, described in the audience section below. The desired final products are intended to serve as global goods – tools that can be adapted and reused by a variety of audience segments for their own internal purposes.

AUDIENCE

The primary audience for this tool is individuals involved with **designing**, **creating** proposals for, **evaluating**, and making **purchasing** decisions regarding the development of digital health systems. This spans a number of actor groups including:

- **National governments**, including health and IT ministries, that are issuing calls for proposals for and/or reviewing potential digital health investments.
- **Regional bodies**, such as those at the sub-regional or region-wide levels, who are making recommendations on and providing guidance on digital health investments.
- **Donors**, who are funding or considering funding digital health activities.
- **Implementers**, who may use the criteria to ensure they are putting forward sound proposals.

INTRODUCTION

It is recognized that not all proposals may have space to detail each area in full. In recognition of this, we have provided references to deliverables or to a project's budget where a proposal may reference the work to be done in a particular area. Given page limitations in RFPs, there is not always space available to fully elaborate a project's digital health approach, and so it is envisaged that this tool can also be used in reviewing and approving workplans or sub-awards.

It is also possible that a proposal will describe more than one digital health intervention; in this case an average might be proposed where a proposal proposes 2 systems (e.g., an SMS appointment reminder system and a facility based Electronic Medical Record (EMR) system). They describe how they will handle security and privacy for the EMR quite well, earning a 5, but fail to describe the security and privacy concerns for the SMS system sending out the messages and how security and privacy would be handled on the recipient's phones, thereby earning a 1. 5+1 = 6 points total divided by the 2 solutions proposed = 3 points average for privacy and security.

Depending on the stage of the system being proposed, more emphasis may be placed on some questions than others. For example, an early stage digital health innovation may be less focused on Total Cost of Ownership for a small field trial as compared to a system being proposed for national scale implementation.

Best Practices to Avoid Common Mistakes

Be sure the solution accounts for:

- **poor connectivity**. System should function well offline with intermittent power or connectivity.
- **maintenance** and **support** costs.
- **training** of new users as health workers are frequently transferred.
- **replacement** of devices due to theft, loss or damage and expected device life-span.
- **interoperability** with other national and local systems.
- **languages**, **literacy**, phone **ownership** and phone **access** of target users.
- **alignment** with the national digital health framework or architecture.
- available physical **infrastructure** within the community the tool is being implemented in.

SCORING

1

Level 1: None or Nascent

No capability is evident or processes are not systematically followed.

2

Level 2: Emerging

Processes and structures are defined but not systematically documented.

3

Level 3: Established

Processes and systems are documented and functional.

4

Level 4: Institutionalized

Ongoing systems and standard practices are used to monitor activities and measure progress.

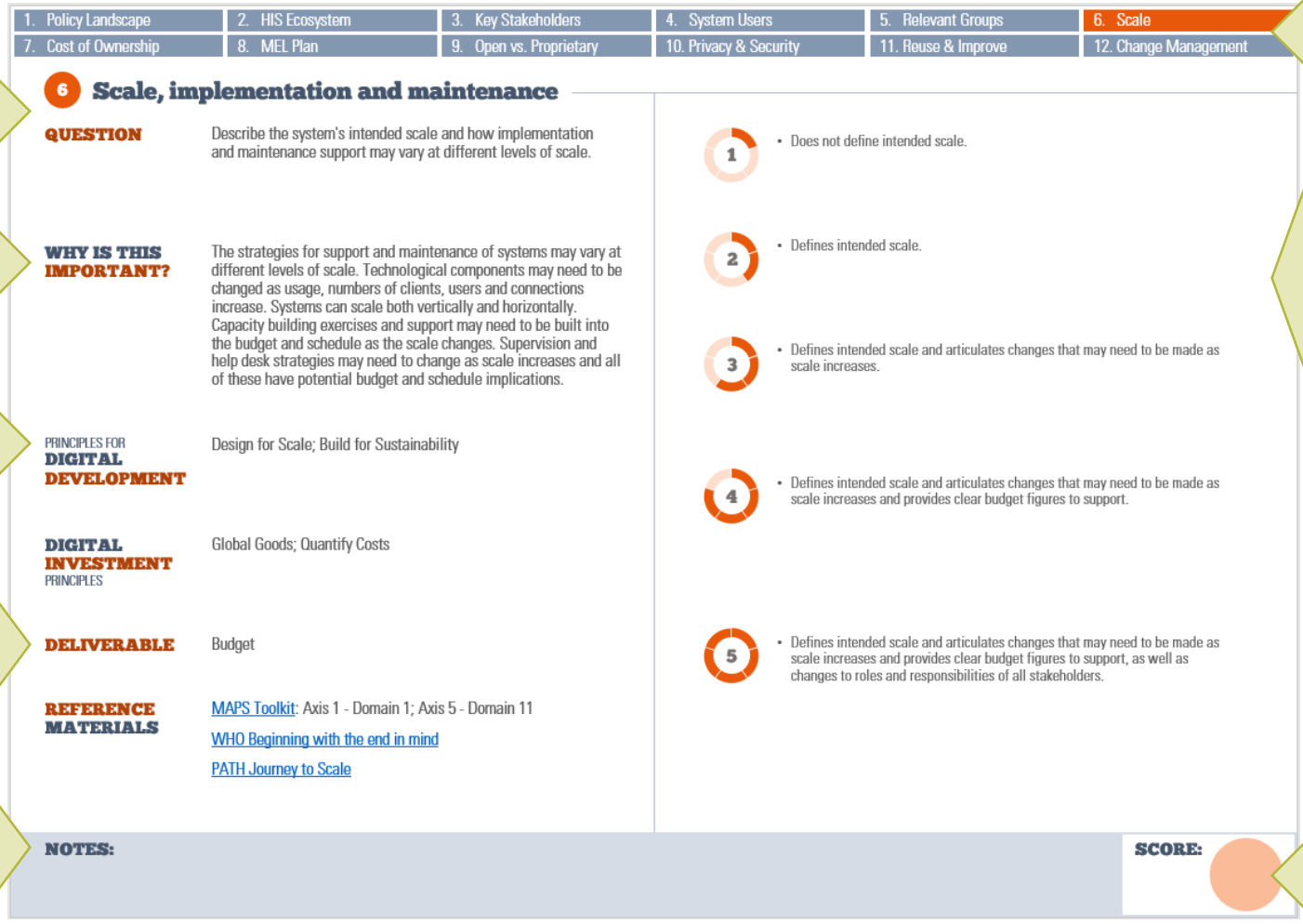
5

Level 5: Optimized

Routine monitoring, reviewing, and updating of processes to measure progress is in place.

HOW TO USE THIS TOOL

There are 12 elements of Digital Health Investment Review Tool included and for each there is a self-assessment worksheet:



The element name and main question for consideration.

An explanation of why it is important to address this element.

Alignment with guiding digital principles.

Recommended deliverable and useful resources to help determine the score.

Space for notes, including evidence/examples for why the score was selected.

Quick reference for the element you are in.

The scoring gives five stage descriptions for the element from **None or Nascent** to **Optimized**. Find the score that describes the level of planning or execution described.

Record the score here.

1 Local eHealth policy landscape

QUESTION

Detail the relevant local eHealth policy and guidelines (could be national, state or district level depending on context of project), health sector strategic plans, health area specific plans (e.g., maternal health strategy), and how the proposed system(s) align(s) with these documents.

WHY IS THIS IMPORTANT?

Interventions designed without an understanding of local policies will be limited in their ability to scale beyond small pilots and may be in violation of existing national government standards or policies. When taking into consideration the digital investment principles, it is important to align investments with national digital health strategies. In addition, it is key to prioritize investments in national plans that incorporate digital global goods and avoid bespoke systems.

PRINCIPLES FOR **DIGITAL DEVELOPMENT**

Design with the User; Understand the Ecosystem; Reuse and Improve; Be Collaborative

DIGITAL INVESTMENT PRINCIPLES

Collaborate; Prioritise National Plans; Maturity Continuum

DELIVERABLE

Landscape Analysis

REFERENCE MATERIALS

WHO eHealth Observatory

MOH eHealth Strategy (can request from relevant MOH)

Global Digital Health Index

MEASURE list of HIS Policies

HIS Maturity Framework

1
- No or scant mention of local policies or guidelines.

2
- Mentions relevant policies and guidelines.

3
- Includes a plan to review existing guidelines and policies.

4
- Details relevant policies and guidelines and how they will influence the system design and implementation.
- Provides plan to strengthen the necessary country policies and governance structures (if needed).

5
- Details current and planned revisions to policies/guidelines and how this may influence system in the future.
- Provides plan to strengthen the necessary country policies and governance structures (if needed).

NOTES:

SCORE:

2 Local HIS ecosystem

QUESTION

Describe the local HIS ecosystem (i.e., other eHealth systems and data sources) and how the proposed system(s) will interact with these resources.

WHY IS THIS IMPORTANT?

Interventions designed without understanding the HIS ecosystem may duplicate existing efforts or improperly leverage existing platforms, data, and registries. This may result in wasted money and limited data sharing opportunities, and may contribute to a fragmented ecosystem.

PRINCIPLES FOR **DIGITAL DEVELOPMENT**

Understand the Ecosystem; Use Open Data, Open Standards, Open Source, and Open Innovation; Be Collaborative

DIGITAL INVESTMENT PRINCIPLES

Collaborate; Prioritise National Plans

DELIVERABLE

Landscape Analysis

REFERENCE MATERIALS

WHO Digital Health Atlas

Global Digital Health Index

HIS Maturity Framework

1
- No or scant mention of other relevant eHealth systems.

2
- Includes a plan to review local HIS ecosystem.

3
- Includes plan to review local HIS ecosystem and mentions other relevant eHealth systems.

4
- Identifies the institutions, communities and individuals that are relevant to the technology-enabled project and its digital systems.
- Provides an assessment of the maturity of these systems and communities.

5
- Clearly assesses the technical environment, including use of existing standards, platforms and tools, and its impact on system interoperability, reuse and adaptation strategies.
- Provides an assessment of the maturity of these systems and communities and identifies how the project will support them further.

NOTES:

SCORE:

3 Stakeholder engagement

QUESTION

Detail your understanding of key stakeholders (system users, beneficiaries, data users, etc.) and plans to engage them.

WHY IS THIS IMPORTANT?

Successful program implementations will identify groups beyond the initial system users and engage them throughout the project development lifecycle. Understanding and addressing their needs and concerns early and communicating consistently can improve likelihood of support. Key stakeholders can also be individuals who invest in these digital technologies. Understanding these stakeholders can strengthen donor technical skills and core capabilities, familiarizing them with the principles of digital development.

PRINCIPLES FOR **DIGITAL DEVELOPMENT**

Design with the User; Understand the Ecosystem; Design for Scale; Build for Sustainability; Be Collaborative

DIGITAL INVESTMENT PRINCIPLES

Strengthen Donor Skills; Track and Measure

DELIVERABLE

Stakeholder Engagement Plan

REFERENCE MATERIALS

MAPS Toolkit: Axis 2 - Domains 4 and 5; Axis 5 - Domain 13; Axis 1 - Domain 2

- No or scant mention of stakeholders.

- Identifies key project stakeholders.

- Identifies key project stakeholders and has a partial plan to engage (often during the beginning or end of a project).

- Identifies all relevant direct and indirect stakeholders.
- Has plan to regularly engage them during all cycles of the project.

- Identifies all relevant direct and indirect stakeholders.
- Has plan to regularly engage them during all cycles of the project.
- Demonstrates clear understanding of varying needs and motivations of these groups and has plan to address them.
- Has plan to improve the capacity of stakeholders to govern and utilize the system.

NOTES:

SCORE:

4 User engagement

QUESTION

Detail your understanding of all system users (i.e., those who will actually access or provide input to the system), their needs and a plan to engage them throughout process.

WHY IS THIS IMPORTANT?

Failure to understand and involve a system's users is one of the top reasons that information technology systems fail to reach their potential. Understanding users and getting their feedback throughout the implementation timeline will result in a tool that is more usable, has a greater chance of being adopted and will increase user ownership of the system.

PRINCIPLES FOR **DIGITAL DEVELOPMENT**

Design with the User; Understand the Ecosystem; Design for Scale; Build for Sustainability; Be Collaborative

DIGITAL INVESTMENT PRINCIPLES

Track and Measure; Sharing and Peer-learning

DELIVERABLE

Stakeholder Engagement Plan

REFERENCE MATERIALS

Principles for Digital Development Design with the User Guide

tools4dev Stakeholder Analysis Matrix Template

1

- No or scant description of system users or plan to engage them.

2

- Identifies potential system users.

3

- Identifies potential system users.
- Plans to engage users during the design process only.

4

- Identifies potential system users.
- Plans to engage all relevant users during the design, deployment and maintenance phases.

5

- Identifies potential system users.
- Plans to engage all system users throughout the design, deployment and maintenance phases.
- Demonstrates clear understanding of user needs and details plan to support users to adapt to any new practices.

NOTES:

SCORE:

5 Collaboration with relevant groups

QUESTION

Describe how the project will collaborate with relevant local, national and international groups during the design, development, assessment and dissemination phases.

WHY IS THIS IMPORTANT?

The involvement of local and international communities can contribute to and sustain learnings and implementation beyond the initial phase. This can greatly increase the system's chance of being sustained and scaled and will allow for sustainable country capacity for digital health leadership, governance, and implementation.

PRINCIPLES FOR **DIGITAL DEVELOPMENT**

Understand the Ecosystem; Design for Scale; Be Collaborative

DIGITAL INVESTMENT PRINCIPLES

Country Capacity

DELIVERABLE

Stakeholder Engagement Plan, Documentation and Dissemination Plan

REFERENCE MATERIALS

MAPS Toolkit: Axis 2 - Domain 4; Axis 6 - Domain 16

- No collaboration specified.

- Has identified only dissemination opportunities or local stakeholders.

- Has identified local collaborators and has clear dissemination plans.

- Has identified local, national and international groups to collaborate with throughout the project lifecycle.
- Has clear plans to document and share lessons learned, programmatic and technology approaches used in tools such as the WHO Digital Health Atlas.

- Has identified and prioritized local, national and international groups to collaborate with throughout the project lifecycle.
- Has clear plans to document and share lessons learned, programmatic and technology approaches used, as well as work products (including code and technical documentation) in tools such as the WHO Digital Health Atlas.

NOTES:

SCORE:

6 Scale, implementation and maintenance

QUESTION

Describe the system's intended scale and how implementation and maintenance support may vary at different levels of scale.

WHY IS THIS IMPORTANT?

The strategies for support and maintenance of systems may vary at different levels of scale. Technological components may need to be changed as usage, numbers of clients, users and connections increase. Systems can scale both vertically and horizontally. Capacity building exercises and support may need to be built into the budget and schedule as the scale changes. Supervision and help desk strategies may need to change as scale increases, and all of these have potential budget and schedule implications.

PRINCIPLES FOR **DIGITAL DEVELOPMENT**

Design for Scale; Build for Sustainability

DIGITAL INVESTMENT PRINCIPLES

Global Goods; Quantify Costs

DELIVERABLE

Budget

REFERENCE MATERIALS

MAPS Toolkit: Axis 1 - Domain 1; Axis 5 - Domain 11

WHO Beginning With the End in Mind

PATH Journey to Scale

1
- Does not define intended scale.

2
- Defines intended scale.

3
- Defines intended scale and articulates changes that may need to be made as scale increases.

4
- Defines intended scale, articulates changes that may need to be made as scale increases, and provides clear budget figures to support.

5
- Defines intended scale, articulates changes that may need to be made as scale increases, and provides clear budget figures to support, as well as changes to roles and responsibilities of all stakeholders.

NOTES:

SCORE:

7 Total cost of ownership

QUESTION

Describe the total cost of ownership for the proposed system(s) for implementation, operations and maintenance period, and ongoing use, including clearly stating assumptions/roles for other stakeholders.

WHY IS THIS IMPORTANT?

Clear identification of costs during the initial, development and maintenance phases are critical so that a government and potential funders can have a clear view as to what resources are required to support a system. Without this, systems often quickly fall out of use as the minimal resources needed for maintenance or hardware upgrades may not be made available.

PRINCIPLES FOR **DIGITAL DEVELOPMENT**

Design for Scale; Build for Sustainability

DIGITAL INVESTMENT PRINCIPLES

Track and Measure; Quantify Costs

DELIVERABLE

Budget

REFERENCE MATERIALS

MAPS Toolkit: Axis 3 - Domain 6

Principles for Digital Development How to Calculate Total Lifetime Costs of Enterprise Software Solutions

DH&I Working Group TCO tool (coming soon)

WHO Digital Health Implementation Toolkit (coming soon)

- No costs included beyond initial stage.

- Budget includes costs for vendor to support maintenance, without mention of role of local stakeholders.

- Budget includes costs for maintenance and support.

- Budget includes costs to hand system over to government or appropriate local party.

- Budget includes costs to hand system over to government or appropriate local party. Includes costs of training (initial and periodic supportive supervision/refresher training) of government staff and establishment of appropriate hosting environment (if needed).
- Budget has identified potential sources of funds beyond initial request.

NOTES:

SCORE:

8 Measuring system effectiveness and efficiency

QUESTION

Describe the Monitoring, Evaluation and Learning plan to measure effectiveness and/or efficiency of the system(s) and a plan to utilize data generated by the system on a continuous basis.

WHY IS THIS IMPORTANT?

Without a clear plan to demonstrate the effectiveness and/or impact of a particular solution, it will be more difficult to make recommendations for further scale up and to know what adjustments should be made to a system to improve its performance. Rather than introduce new outcome indicators, it is preferable to align with existing national indicators, where possible.

PRINCIPLES FOR **DIGITAL DEVELOPMENT**

Be Data Driven

DIGITAL INVESTMENT PRINCIPLES

Track and Measure; National Strategies; Maturity Continuum

DELIVERABLE

MEL Plan

REFERENCE MATERIALS

MAPS Toolkit: Axis 6 - Domain 16; Axis 4 - Domain 8

mERA Checklist (to determine appropriate level of assessment)

- No MEL plan and no plan to use system data.

- Clear MEL plan.
- No plan to share data back to system users (especially at level of data generation/capture).

- Clear MEL plan and plan to occasionally share data with users.

- Clear MEL plan and articulates use of data generated from system as a byproduct to improve system and program performance.
- Articulates plan to share meaningful data with all levels of system users and stakeholders.

- Clear MEL Plan and articulates uses of data generated from system as by product to improve system and program performance.
- Articulates plan to share meaningful data with all levels of system users and stakeholders, including design sessions to ensure data is in easily usable format.

NOTES:

SCORE:

9 Open standards, data and software

QUESTION

Describe how the project has considered open standards, open data and open source software. If not, please describe why. If not, please describe how the project will adhere to national standards (if not open - see question 1) or how APIs will be developed and shared.

WHY IS THIS IMPORTANT?

Without open standards and data, sharing information across systems becomes nearly impossible. Without well-documented and shared software code, governments are more susceptible to being locked into a particular vendor or solution and finding that they cannot efficiently update their system to address new requirements.

PRINCIPLES FOR **DIGITAL DEVELOPMENT**

Use Open Data, Open Standards, Open Source, and Open Innovation

DIGITAL INVESTMENT PRINCIPLES

Sharing and Peer-learning; Global Goods

DELIVERABLE

REFERENCE MATERIALS

MAPS Toolkit: Axis 4 - Domain 9

Principles for Digital Development Guide: Use Open Standards, Open Data, Open Source, and Open Innovation

1

- No mention of open source tools or plans to use proprietary tools without providing any rationale.
- No mention of open standards or open data.

2

- Mentions use of open source software.
- If not open source, provides rationale for using proprietary tools.
- No mention of open standards or open data.

3

- Open source software planned and has strong community.
- If not open source, proposes to use proprietary system with clear rationale.
- Proposes to adhere to open standards and to use open data.
- Mentions developing an API for data sharing.

4

- Project uses open source software with strong community, open data, open standards and has plans to update relevant code bases.
- If not open source, proposes to use proprietary system with clear rationale. Proposes to provide developer guide to allow for updates/modifications of system.
- Proposes to use open data and adhere to open standards.
- Has developed well-documented API for data sharing.

5

- Project uses open source, open data, open standards and has plans to update relevant code bases. Includes plan to engage with and strengthen relevant open source software community.
- If not open source, project has strong justification for use of proprietary software and explains how software aligns with national standard. Plans to use open data and adhere to open standards. Proposes to provide developer guide to allow for updates/modifications of system. Has identified local community of developers that can support.
- Has developed well-documented API for data sharing.

NOTES:

SCORE:

10 Privacy and data security

QUESTION

Describe how privacy and data security will be addressed.

WHY IS THIS IMPORTANT?

Digital health projects may deal with sensitive medical information and clients have a right to have their information managed responsibly. Fear of loss of privacy may be a barrier to use of a system or accessing services. Security breaches can be damaging for governments and negatively impact the public's confidence.

PRINCIPLES FOR **DIGITAL DEVELOPMENT**

Address Privacy and Security

DIGITAL INVESTMENT PRINCIPLES

DELIVERABLE

Security Plan and Privacy Plan

REFERENCE MATERIALS

MAPS Toolkit: Axis 4 - Domain 8

Principles for Digital Development How to Secure Private Data/Security in Cloud

- No mention of privacy or security of data.

- Partially or generically discusses privacy and security approaches to be used.

- Mentions nationally and internationally relevant security policies and partially or generically discusses how security will be implemented.

- Fully describes relevant policies as well as front-end security, back-end security, encryption and physical security.

- Fully describes relevant policies as well as front-end security, back-end security, encryption and physical security.
- Includes plan to audit security as routine maintenance function.

NOTES:

SCORE:

11 Reusing and improving existing resources

QUESTION

Describe the plan to assess, review, reuse and improve on existing frameworks, content, technologies, etc., in the design, development and deployment of the system(s).

WHY IS THIS IMPORTANT?

Each program and country is unique but there are many common elements, messages, approaches, workflows and code bases that have been developed to address health systems challenges. Reusing and adapting these resources can accelerate time to market, reduce costs and improve the base of global goods available to other practitioners.

PRINCIPLES FOR **DIGITAL DEVELOPMENT**

Understand the Ecosystem; Reuse and Improve; Be Collaborative

DIGITAL INVESTMENT PRINCIPLES

Prioritise National Plans; Quantify Costs; Global Goods

DELIVERABLE

Landscape Analysis

REFERENCE MATERIALS

WHO Digital Health Atlas

Content (ORB Platform)

Commcare Exchange

Digital Square Global Goods

- No plan to explore reusing and improving on existing frameworks, content and technologies.

- Plans to assess the feasibility of reusing and improving on existing frameworks, content and technologies.

- Has clear plan to assess the re-use of existing frameworks, content and technologies and articulates how these can be adapted to the local context.

- Has clear plan to assess the re-use of existing frameworks, content and technologies and articulates how these can be adapted to the local context.
- Has clear plan to improve on these frameworks, technologies and approaches.

- Has clear plan to assess the re-use of existing frameworks, content and technologies and articulates how these can be adapted to the local context.
- Has clear plan to improve on and share back these improvements in appropriate fora.

NOTES:

SCORE:

12 Change management strategy

QUESTION

Describe the strategy to manage the change required to successfully design, develop, deploy and support the proposed system(s).

WHY IS THIS IMPORTANT?

Introducing new processes and tools can have a disruptive effect on a workplace and health system. Even well-designed systems can meet resistance from stakeholder groups at any point in the system development lifecycle and negatively impact the effectiveness of a solution. Change management can help communicate to stakeholders why a tool is being developed, how it will impact their work and how they will benefit.

PRINCIPLES FOR **DIGITAL DEVELOPMENT**

Design with the User; Understand the Ecosystem; Build for Sustainability; Be Collaborative

DIGITAL INVESTMENT PRINCIPLES

Collaborate; Quantify Costs; Prioritise National Plans; Country Capacity

DELIVERABLE

Stakeholder Engagement Plan, Budget, Change Management Plan

REFERENCE MATERIALS

- No change management strategy.

- Has plan to support limited group of stakeholders (clients, end users, managers).

- Has identified project sponsors.
- Has plan to support multiple stakeholder groups (clients, end users, managers).
- Has limited discussion of impact of project on business processes.

- Has identified project sponsors and plans to develop sponsor activities.
- Has plan to support multiple stakeholder groups (clients, end users, managers).
- Has basic business process re-engineering strategy.

- Has identified project sponsors and plans to develop sponsor activities.
- Has clearly identified all groups affected by system, has identified their needs in adjusting to system and has plan to support them throughout the process.
- Has plan to identify and manage resistance as well as communicate success.
- Includes comprehensive business process re-engineering plan.

NOTES:

SCORE:

Total Digital Health Investment Score

1. **Local eHealth policy landscape**
2. **Local HIS ecosystem**
3. **Stakeholder engagement**
4. **User engagement**
5. **Collaboration with relevant groups**
6. **Scale, implementation and maintenance**
7. **Total cost of ownership**
8. **Measuring system effectiveness and efficiency**
9. **Open standards, data and software**
10. **Privacy and data security**
11. **Reusing and improving existing resources**
12. **Change management strategy**

TOTAL SCORE:

DELIVERABLES

DELIVERABLE	DESCRIPTION	EXAMPLE	SOURCE
Stakeholder Engagement Plan	A plan to help project managers engage effectively with stakeholders throughout the life of the project, and which specifies activities that will be conducted to manage engagement.	Sample Stakeholder Engagement Plan	Global Health Learning Center
Documentation and Dissemination Plan	A plan that specifies how project documentation will be developed and how project information will be disseminated to stakeholders. This would include who receives what, when and how.	Strategic Dissemination Plan	K4Health
Security and Privacy Plan	Outlines security requirements for the system, describes controls in place, responsibilities and expected behavior of system users, and how data collected and stored in the system will be protected from unauthorized access and use.	IT Security Plan template mHealth Data Security, Privacy, and Confidentiality Guidelines: Companion Checklist	Georgia Technology Authority MEASURE Evaluation
Change Management Plan	A framework for managing the effect of new business processes, changes in organizational structure, or shifting roles as a result of the introduction of new technology.	Change Management Approach Template	CRVS Digitisation Guidebook
Monitoring Evaluation and Learning Plan	Describes the process for monitoring, evaluating and learning from system implementation in order to achieve results. This includes indicators to be used, what information will be collected, how it will be collected, and how implementation will be adapted to ensure system goals are met.	MEL Guide	Scotland's International Development Alliance
Landscape Analysis	A review of existing systems (both automated and paper-based), and where gaps and opportunities exist.	Ghana System Landscape Assessment	CRVS Digitisation Guidebook
As-is Work Flows - Design Document	Describes how data flows in the current system.	Ghana – Marriage Registration_As-Is Process_FINAL	CRVS Digitisation Guidebook

DELIVERABLES

DELIVERABLE	DESCRIPTION	EXAMPLE	SOURCE
To-be Work Flows - Design Document	Describes how data will flow in the proposed system.	Kenya TO-BE Birth Registration Process	CRVS Digitisation Guidebook
Requirements Document	A detailed description of all the system properties that specifies how the system should work.	Common Requirements for Logistics Management Information Systems	International Association of Public Health Logisticians
User Guide	Step-by-step instructions for how to use the system for end users.	iHRIS Manager User Manual	iHRIS Software Documentation
Systems Administration Guide	Instructions for deploying, configuring and maintaining the system.	OpenMRS Administration Guide	OpenMRS Wiki
Communications Plan	Policies for providing stakeholders with information, including who receives what, when, and through what channels (how). Often a part of the dissemination plan and/or the stakeholder engagement plan.	CRS Developing a Communications Plan	Catholic Relief Services Communication Toolbox
RACI diagram showing roles and responsibilities of stakeholders	A matrix showing all activities and stakeholders' roles in relation to each activity (responsible, accountable, consulted or informed).	Planning an Information Systems Project: A Toolkit for Public Health Managers, Annex 2	mHealth Knowledge
Training Plan (for users and IT staff)	Outlines the details of the formal training on using or administering the system. Includes the objectives, needs, strategy and curriculum of the training.	Training Approach Template	CRVS Digitisation Guidebook
Total Cost of Ownership	Outlines the costs associated with planning, developing and maintaining a system for initial as well as outyears.	CommCare Total Cost of Ownership Model	Dimagi

GLOSSARY

TERM	DEFINITION	RESOURCE
API (Application Programming Interface)	A code that allows two software programs to communicate with each other. The application programming interface (API) defines the correct way for a developer to write a program that requests services from an operating system or other application. APIs are implemented by function calls composed of verbs and nouns. The required syntax is described in the documentation of the application being called.	HIMSS News; Understanding Application Programming Interfaces (APIs)
Application	A piece of software which can be installed on a device to perform one or more digital health interventions.	HIMSS; Ontology & Definitions
Data Warehouse	A large database that stores information like a data repository but goes a step further, allowing users to access data to perform research-oriented analysis.	AeHIN Digital Health Terminology Guide, page 6
Database	A set of related data and the way it is organized. Access to this data is usually provided by a database management system (DBMS) consisting of an integrated set of computer software that allows users to interact with one or more databases and provides access to all of the data contained in the database (although restrictions may exist that limit access to particular data). The DBMS provides various functions that allow entry, storage, and retrieval of large quantities of information and provides ways to manage how that information is organized. Because of the close relationship between them, the term “database” is often used casually to refer to both a database and the DBMS used to manipulate it.	AeHIN Digital Health Terminology Guide, page 6
Enterprise Architecture	A comprehensive framework used to manage and align an organization's IT assets, people, operations, and projects with its operational characteristics, and defines how IT will support the business operations and provide benefit for the business.	AeHIN Digital Health Terminology Guide, page 11
Health Information System (HIS)	Any system that captures, stores, manages, or transmits information related to the health of individuals or activities of organizations that work within the health sector. The system typically maps the business process of an organization (e.g., a hospital, a health insurance fund, disease management program) and focuses on data processing (e.g., claim reimbursement) rather than data collection only.	Health informatics — Capacity-based eHealth architecture roadmap Part 2: Architectural components and maturity model

GLOSSARY

TERM	DEFINITION	RESOURCE
Interoperability	The ability of two or more systems or components to exchange information and to use the information that has been exchanged.	Health informatics — Document registry framework
Open Data	Publicly available data that can be universally and readily accessed, used and redistributed free of charge. It is structured for usability and computability. *(Source: Digital Impact Alliance)*	Open Data Commons; Making Your Data Open: A Guide
Open Innovation	Refers to co-created ideas, concepts and design or to inviting the contribution of ideas. *(Source: Digital Impact Alliance)*	Principles for Digital Development; Use Open Standards, Open Data, Open Source, and Open Innovation
Open Source	Software with source code that anyone can view, copy, modify and share. *(Source: Digital Impact Alliance)*	Open Source Initiative; The Open Source Definition
Open Standards	Data standards are "documented agreements on representations, formats, and definitions of common data. Data standards provide a method to codify invalid, meaningful, comprehensive, and actionable ways, information captured in the course of doing business."	Public Health Data Standards Consortium; Health Information Technology Standards
Platform (or Package)	A suite of components and tools which allow a developer to write, test and deploy applications.	
User-Centered Design	An iterative design process in which designers focus on the users and their needs in each phase of the design process. UCD calls for involving users throughout the design process via a variety of research and design techniques so as to create highly usable and accessible products for them.	usability.gov; User-Centered Design Basics

Many terms from AeHIN's Digital Health Terminology Guide

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All attendees of 24 May 2017 workshop

All attendees of 2017 Global Digital Health Forum session

Health Data Collaborative, Digital Health & Interoperability Working Group, small group (Carl Leitner - Digital Square, Alain Labrique - Johns Hopkins University)

Special thanks

Carolyn Florey	Digital Impact Alliance
Alanna Nelson	Digital Impact Alliance

Please contact Steve Ollis (steve_ollis@jsi.com) with any questions or comments.

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