A Roadmap for Digital Health Transformation in Mauritius

The United Nations Development Programme (UNDP) works with the Mauritius Ministry of Health and Wellness on digital transformation of the national health sector. This case study was developed by the UNDP Digital Health for Development Hub in partnership with the Mauritius Country Office to promote exchange of knowledge and South-South collaboration on digital health. The case study provides valuable insights and learnings, serving as a resource to guide other UNDP country teams for working on national digital health initiatives.

Early experiences shape digital health transformation in Mauritius

The Republic of Mauritius has a population of 1,260,767 people and consists of the main island of Mauritius and two other islands, Rodrigues and Agalega.[1] Guided by the Health Sector Strategic Plan (2020–2024), the Ministry of Health and Wellness oversees the country's strong health system, which offers free universal access to health care services to every citizen.[2] An estimated 73 percent of health care services are provided through a network of 157 public health facilities, including regional hospitals, district and community hospitals, mediclinics, area and community health centers and specialized hospitals that are well distributed across the islands; the remaining care is delivered by private sector providers. The health system is supported by a public health workforce of 14,000 staff that includes doctors, nurses, dentists, pharmacists and other health workers, of which 55 percent are women. Over the last nine years,

government spending on health care has increased by over 70 percent from MUR 9.2 billion in 2014 to MUR 15.7 billion in fiscal year 2023–2024.[3]

COVID-19 digital experience

Like other countries around the globe, in 2020 the Republic of Mauritius was hit by the COVID-19 pandemic, which strained health resources and had significant economic impacts.[4] Building on existing relationships, UNDP Mauritius partnered with the Ministry of Health and Wellness to support an inclusive, multisectoral response to COVID-19 which included recovery efforts to address the socio-economic impacts of the pandemic. When COVID-19 arrived in the country, the health system consisted mostly of paper-based processes with some fragmented digital systems, which proved challenging for access to real-time data for delivery of health services and rapid decision-making. There was a critical need for a laboratory information system to expedite the ordering of COVID tests and share test results. To address this gap, UNDP Mauritius contracted with the University of Washington to implement OpenELIS, an open-source

solution, and provided the information technology (IT) equipment and on-the-ground technical support needed for configuration, implementation and adoption of the laboratory information system.[5] Use of OpenELIS proved effective in supporting COVID-19 response activities. OpenELIS was later enhanced to support the All-In-One Travel Form border control processes which required all passengers landing in the country to obtain COVID screening (restrictions have since been lifted).[6] Today, the OpenELIS system is being scaled up to support laboratory orders and test results for other diseases.

For the Ministry of Health and Wellness, the COVID-19 pandemic underscored the urgency of health system resilience to withstand future outbreaks and shocks. The valuable experience gained through implementation and use of the laboratory information system demonstrated the efficiencies of digital solutions and prepared stakeholders to embark on a digitization journey. Motivated by these experiences, as well as a desire to continually enhance the delivery of health care services and improve health outcomes, the Ministry of Health and Wellness requested UNDP Mauritius technical expertise for undertaking digital transformation across the health system.

Roadmap to digital transformation

UNDP Mauritius, the Ministry of Health and Wellness and other stakeholders initially collaborated to develop a vision and theory of change to replace paper-based processes with a modern and integrated eHealth system to improve the quality of care services in public regional hospitals and healthcare centers.

> *"To capitalize on Information and Communication Technologies to create an interoperable national digital health architecture and associated standards that help drive decisions for investment for digital health system components to ensure continuity of care through affordable, high-quality, user-centric services to all health care stakeholders in Mauritius."*
>
> *– Republic of Mauritius, Vision for Digital Health Transformation*

To inform country plans, stakeholders embarked on a study tour to Rwanda in 2022 to learn from Rwanda's experiences, challenges and promising approaches. Emerging from these initial activities, the following objectives were identified for the Mauritius Digital Health Systems Strengthening initiative:

- ☑ Enhance the accessibility and quality of health care services.
- ☑ Enhance the effectiveness and efficiency of health care services.
- ☑ Optimize administrative processes to improve overall healthcare system efficiency.
- ☑ Establish a robust IT-enabled management and monitoring system.
- ☑ Improve data management and information-sharing among healthcare professionals.
- ☑ Establish a secure and interoperable electronic health records (EHR) system (One Patient, One Record).
- ☑ Facilitate real-time monitoring and reporting for public health initiatives.

Working alongside the Ministry, UNDP Mauritius helped stakeholders develop a roadmap that consisted of a phased approach to the initiative and addressed key aspects of the underlying enabling environment, including, policy, strategy, governance, human resources and a national digital health architecture.

> *"The eHealth project was not just about digitizing a system, it also meant business process re-engineering, site assessments, having the right legislation and ensuring health officials have the right technical knowledge to adopt and use the IT system. Equally important is to ensure that the population at large can easily access the system."*
>
> *– Vichittra Purdassee, Digital Transformation Project Manager, UNDP Mauritius and Seychelles*

UNDP Mauritius provided technical expertise to support planning and implementation activities, including project management, change management (communications, training and capacity-building), knowledge management, business process/workflow redesign, system design and implementation, reporting and analytics, and end-user engagement.

Creating enabling policies, governance and strategic plans

To approach digital transformation holistically, stakeholders outlined plans to develop enabling polices and a governance structure, and to align strategic priorities to affirm government commitment and leadership.

Policies

In recent years, the Republic of Mauritius has passed legislation on data protection, cybersecurity and cybercrime, and electronic transactions, the Information and Communications Technologies Act and the Mauritius Emerging Technologies Council Act.[7,8,9,10,11] Despite these legislative actions, the Ministry of Health and Wellness does not currently have provisions that adequately address the use of EHRs, data-sharing and more. To close these gaps, the country is developing comprehensive digital health legislation to regulate data protection, access to health data, and build advanced capacity to develop and responsibly use Artificial Intelligence. Under the project, legal experts will support the review and assessment of a legal framework for digital health, draft a policy paper based on the country context and develop the bill (if required) at the direction of the Ministry of Health and Wellness and other stakeholders.

Governance and staffing

The Mauritius Digital Health Systems Strengthening initiative was initially coordinated through a planning working group led by the Ministry of Health and Wellness. It is now in the process of transitioning into a formal governance structure with committees for technical areas. Multisectoral stakeholders participating in governance and coordination activities include the Ministry of Health and Wellness, the Ministry of Information Technology, Communications and Innovation, the Ministry of Finance, Economic Development and Planning, and UNDP Mauritius. Through the new governance structure, these stakeholders will continue to drive digital transformation efforts by shaping plans, directing investments and establishing priorities.

Working with Mauritius, the Ministry of Health and Wellness has developed plans for a Digital Health Agency, approved by Cabinet on 24 August 2024.[12] UNDP Mauritius has also recruited a team to work on the Mauritius Digital Health Systems Strengthening initiative and managed complex procurement processes to bring in additional technical consultants to fill specific skills gaps, as well as technology partners to support system design, configuration and implementation. However, the recruitment of technical experts was challenging due to the lack of technical resources in the market.

Strategic plans

While Mauritius has no specific digital health strategy, other strategic documents set a precedent and provide the necessary guidance and commitment for investments in digital health. The mission statement of the Ministry of Health and Wellness mentions technology in the following statement: "Harness the full potential of ICT to empower people to live healthy lives." Building on this, strategic goal 18 of the Health Sector Strategic Plan (2020–2024) calls for the generation of sound and reliable information at all levels of the health system in a holistic approach for better decision-making through the implementation of the eHealth project.[13] In addition, the Digital Government Transformation Strategy 2018–2022 outlined plans to optimize, transform and create better government services, including health care, through digitization.[14] Collectively these strategic documents provide a foundation and a common vision for digital investments in the health system and facilitate country ownership and management of the journey.

Planning for One Patient, One Record

Central to the Mauritius Digital Health Systems Strengthening initiative is the One Patient, One Record project, which includes shifting from paper-based processes at health facilities to making use of a patient portal and patient administration system (PAS) (inclusive of EHR capabilities) and a few other baseline modules enabling health care workers to access health information needed to coordinate care and deliver services. The project has been allocated a budget of MUR 600 million and divided into several phases.[15]

> *"The launch of the eHealth project in Mauritius transcends being a mere milestone; it signifies a giant leap towards a healthier, more connected future for our nation. Let's embrace this technological evolution with open arms, confident that we are paving the way for a healthcare system that is not only efficient but also compassionate and patient-centric."*
>
> **– Amanda Serumaga, Resident Representative, UNDP Mauritius and Seychelles**

UNDP Mauritius worked with the Ministry of Health and Wellness and partners in identifying requirements and engaging in a procurement process to select a technology partner, TrioTree Technologies Pvt. Ltd., and its consortium of partners, namely Informatics International Ltd. and Netcom Partners Ltd. Once on board, TrioTree and partners conducted a readiness assessment at public health facilities. The assessment gathered information to better understand the eHealth maturity at facilities, including IT gaps (hardware, software, electrical infrastructure) to inform infrastructure needs and staff skills. The readiness assessment found that most clinical data were being captured in an unstructured format in hundreds of paper forms, journals, books and letters and would need to be re-engineered into the PAS system.

To develop the change management plans, TrioTree will consider findings from the readiness assessment and conduct a deeper stakeholder analysis to evaluate influence, interests and potential resistance to change. UNDP Mauritius has requested TrioTree to then develop a clear vision and set of objectives for change management, communication plans, training and education plans, leadership engagement and identification of champions, empowerment activities, and mechanisms for feedback and continuous improvement.

The One Patient, One Record project is broken down into two major phases to iteratively configure the PAS system modules and functionalities to country needs, support training and engage in a national roll-out.

Under Phase 1, the following core modules of the PAS system are planned:

- PAS system (including national patient register, medical file tracking and electronic queue management)
- Patient portal (including a patient app)
- Blood bank implementation at blood transfusion services (including a donor app)
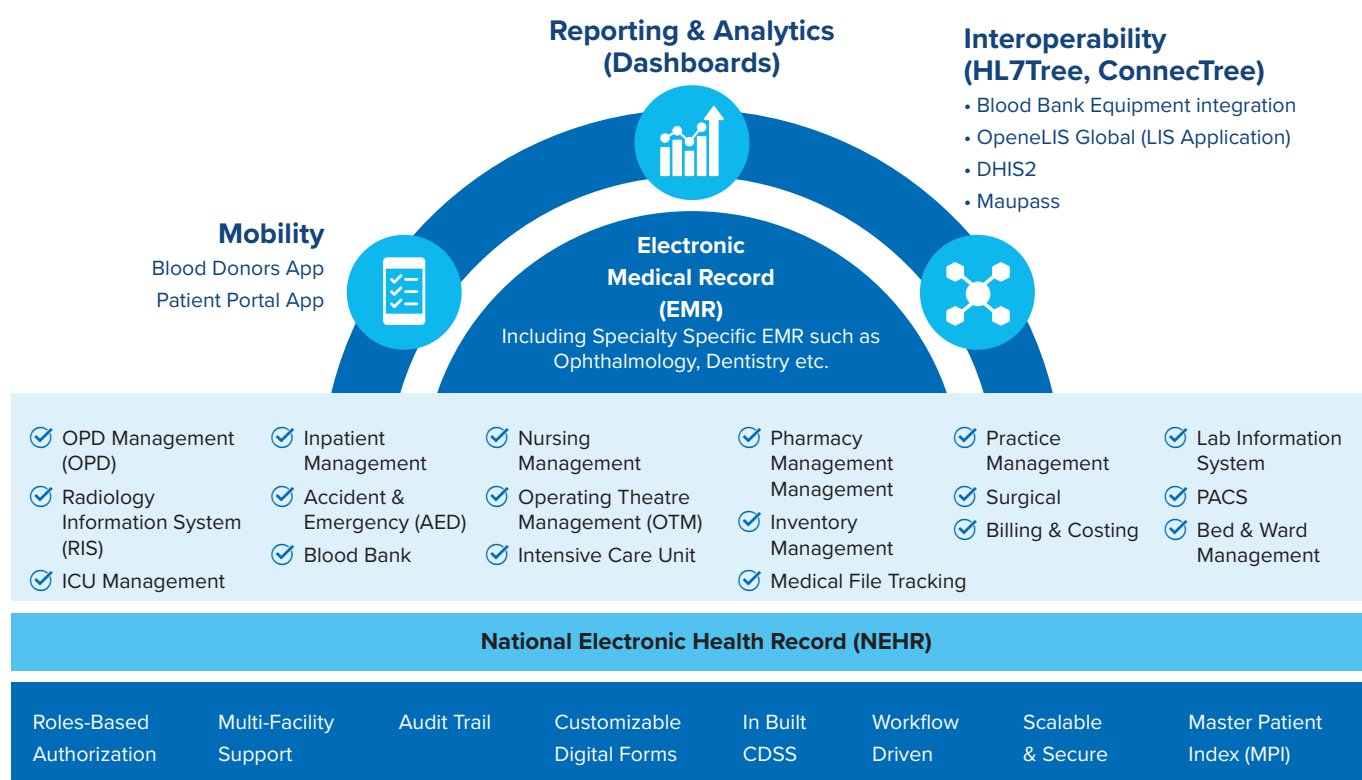- Query and reporting (analytics).

The Phase 1 PAS system and functionalities will be tested at the Jawaharlal Nehru Regional Hospital and subsequently extended to other regional hospitals, health centers, community centers and mediclinics. At the conclusion of Phase 1 and following operational acceptance, UNDP Mauritius plans to hand over ownership and management of the project to the Ministry of Health and Wellness to manage the next steps.

Under Phase 2, the following additional eHealth modules are planned:

- Radiology (including a picture archiving and communication system – PACS)
- Laboratory (integration with existing and new laboratory services)
- Nursing module (collection of vitals, among others)
- Pharmacy (including inventory)
- Public health and primary care support services
- Non-communicable diseases services
- Bed and ward management
- Surgical (operating theatre)
- Intensive care
- Clinical practice management (including dental services, paramedical services, etc.)
- Billing and costing.

Once fully implemented and scaled, the One Patient, One Record system will enable all citizens of Mauritius to have one longitudinal health record that is accessible in real-time to health workers to coordinate care, deliver services and improve health and wellness. It will also provide a patient portal to empower citizens to be actively engaged in making informed decisions about their health care and treatment.

Figure 1. Mauritius PAS system and modules

Reporting & Analytics (Dashboards)

Interoperability (HL7Tree, ConnecTree)
- Blood Bank Equipment integration
- OpeneLIS Global (LIS Application)
- DHIS2
- Maupass

Mobility
Blood Donors App
Patient Portal App

Electronic Medical Record (EMR)
Including Specialty Specific EMR such as Ophthalmology, Dentistry etc.

- OPD Management (OPD)
- Radiology Information System (RIS)
- ICU Management
- Inpatient Management
- Accident & Emergency (AED)
- Blood Bank
- Nursing Management
- Operating Theatre Management (OTM)
- Intensive Care Unit
- Pharmacy Management Management
- Inventory Management
- Medical File Tracking
- Practice Management
- Surgical
- Billing & Costing
- Lab Information System
- PACS
- Bed & Ward Management

National Electronic Health Record (NEHR)

| Roles-Based Authorization | Multi-Facility Support | Audit Trail | Customizable Digital Forms | In Built CDSS | Workflow Driven | Scalable & Secure | Master Patient Index (MPI) |

A blueprint for a national digital health architecture

To prevent fragmentation and promote interoperability of data and digital solutions across the health system, the Republic of Mauritius is developing a Digital Health Blueprint. The Blueprint is intended to outline a national digital health architecture that aligns business processes, provides a platform with shared services (e.g. health facility registry, provider directory, master patient index), connects digital applications, details standards and implementation guidance, and scales data exchange.[16]

To support this process, UNDP Mauritius has hired technical experts to conduct a technical review, facilitate stakeholder engagement and consultations, develop guiding principles, design the blueprint and interoperability plans, assess capacity and technical assistance needs, and develop an implementation plan and other supporting materials. The Digital Health Blueprint will consider business objectives, current and future digital health applications, definition of concepts, and data and exchange standards. When implemented, the national digital health architecture – the PAS under the One Patient, One Record project – becomes the baseline for scaling up the other IT systems supporting health programmes.

Key learnings

Through a step-by-step and iterative approach that considers not just the technology but other components needed to implement, sustain and effectively use interoperable digital health systems, UNDP Mauritius and the Ministry of Health and Wellness have already overcome numerous challenges and gained experience that is shaping their next steps.

Key learnings include:

- **Build strong partnerships:** UNDP Mauritius worked alongside the Ministry of Health and Wellness and engaged in partnership-building activities with other stakeholders throughout the planning process and continues to do so. Throughout the Mauritius Digital Health Systems Strengthening initiative, many stakeholders were engaged in governance meetings and processes representing varied perspectives and priorities. The UNDP Mauritius team supported robust engagement with all these stakeholders to gain buy-in and alignment to move forward with shared plans. Governance and coordination with key stakeholders are ongoing activities that are essential to ensure buy-in and alignment and develop shared plans.

- **Promote government leadership and capacity:** Through the Mauritius Digital Health Systems Strengthening initiative, the Ministry of Health and Wellness is not only a key stakeholder but has led and directed plans based on country needs and priorities. UNDP Mauritius works side by side with government leaders to build their internal capacity and consider the internal staff and expertise needed to support the initiative and realize their vision. UNDP country teams can assist governments in thinking through their needs, priorities and staffing to strengthen their leadership in digital health.

- **Assess readiness:** Early in the planning stage for the One Patient, One Record project, it was apparent that there were varied levels of readiness in terms of health facility infrastructure and workforce skills. UNDP Mauritius required a readiness assessment to be conducted as a first step to better understand the gaps and needs, and then outlined clear plans to address them. Understanding readiness is an important early step in planning that helps shape the subsequent activities and select appropriate resources and technologies to set countries on a path to success.

- **Invest in the enabling environment:** UNDP Mauritius technical guidance proposed a robust planning process that considered not just technology needs but also staffing, governance, strategy, policy and more in an integrated approach. The planning process led to a holistic approach that is setting up the Mauritius Digital Health Systems Strengthening initiative for long-term success. To ensure sustainability of digital health investments, it is essential for UNDP country teams to assess the broader enabling environment and identify gaps or challenges that need to be addressed to successfully implement, sustain and effectively use interoperable digital health systems.

- **Support country procurement processes:** The UNDP Mauritius team experienced lengthy procurement procedures and administrative hurdles in selecting technical solutions and onboarding technology partners. UNDP Mauritius worked closely with government leaders to navigate procurement challenges and invested time in due diligence activities. Despite experiencing challenging procurement processes, UNDP country teams can provide the support needed to help mitigate them and ensure the right resources and solutions are identified and purchased to meet country needs.

- **Navigate complex implementation:** The Mauritius Digital Health Systems Strengthening portfolio presents complex implementation challenges due to the concurrent execution of multiple initiatives, including the laboratory information system, readiness assessments, human resources management and the One Patient, One Record system. To navigate this complexity, it has been imperative for UNDP Mauritius to establish a cohesive and collaborative working relationship among all stakeholders, with staff dedicated to project implementation. This approach ensures effective task management, synchronization and dependency resolution, enabling seamless coordination across interdependent activities.

●●●● Future plans

> *"We are impacting the life of every citizen with this digital health transformation. For years Mauritius has been trying to transition from a paper-based health system to digital, and this is the moment. This will impact the life of every citizen, giving access their health information anytime. That's a big step in the journey of transformation."*
>
> **– Renooka Beejan, Head of Socio-Economic Development Unit, UNDP Mauritius and Seychelles**

UNDP Mauritius continues to support the Republic of Mauritius on its digital health transformation journey through collaboration, technical support and investments in the digital health enabling environment, including digital health solutions, policy, strategy, governance, human resources and a national digital health architecture. Through these activities, the country is building a more resilient health system and ensuring continuous improvement in the delivery of high-quality, coordinated, user-centric health services to improve health outcomes.

1   Statistics Mauritius, 'Tableau de Bord', Government of Mauritius, 2023, https://statsmauritius.govmu.org/Pages/Statistics/Tableau-de-Bord.aspx.

2   Ministry of Health and Wellness, 'Health Sector Strategic Plan 2020–2024', Government of Mauritius, Port Louis, 2019, https://health.govmu.org/health/wp-content/uploads/2023/03/Health-Sector-Strategic-Plan-2020-2024.pdf.

3   United Nations Development Programme , 'Overview of Mauritius Health Sector and eHealth FV', UNDP, 2 May 2024.

4   United Nations Development Programme, 'Socio-Economic Impact Assessment of COVID-19 in Mauritius', UNDP, Port Louis, 2 March 2021, https://www.undp.org/africa/publications/socio-economic-impact-assessment-covid-19-mauritius.

5   See https://openelis-global.org/.

6   See https://safemauritius.govmu.org/.

7   Government of Mauritius, 'Data Protection Act 2017', Government of Mauritius, 2017, https://dataprotection.govmu.org/Pages/The%20Law/Data-Protection-Act-2017.aspx.

8   Government of Mauritius, The Cybersecurity and Cybercrime Act 2021, Act No. 16 of 2021, Legal Supplement to the Government Gazette of Mauritius, No. 173, 24 November 2021, https://ncb.govmu.org/ncb/legislations/THE%20CYBERSECURITY%20AND%20CYBERCRIME%20ACT%202021.pdf.

9   Government of Mauritius, 'The Electronic Transactions Act 2000, Act 23/2000', Government of Mauritius, Port Louis, 2000, https://www.icta.mu/documents/2021/08/eta.pdf.

10 Government of Mauritius, 'Information and Communication Technologies Act 2001, Act 44/2001', Government of Mauritius, Port Louis, 2022, https://www.icta.mu/documents/2022/04/ict_act.pdf.

11 Government of Mauritius, 'The Mauritius Emerging Technologies Council Act 2021, Act No. 10 of 2021', Government of Mauritius, Port Louis, 2021, https://mitci.govmu.org/Documents/Legislations/Mauritius%20Emerging%20Technologies%20Council%20Act%202021.pdf.

12 Defimedia, 'eHealth : une Digital Health Agency verra le jour', Defimedia, 16 August 2024, https://defimedia.info/ehealth-une-digital-health-agency-verra-le-jour.

13 Ministry of Health and Wellness, 'Health Sector Strategic Plan 2020–2024', Government of Mauritius, Port Louis, 2019, https://health.govmu.org/health/wp-content/uploads/2023/03/Health-Sector-Strategic-Plan-2020-2024.pdf.

14 Central Informatics Bureau, Ministry of Technology, Communication and Innovation, 'Digital Government Transformation Strategy 2018–2022', Government of Mauritius, Port Louis, 2017, https://ncb.govmu.org/ncb/strategicplans/DigitalGovernmentTransformation.pdf.

15 United Nations Development Programme, 'UNDP supports the launch of the "One Patient, One Record" eHealth Project for Enhanced Public Healthcare', UNDP, 29 January 2024, https://www.undp.org/mauritius-seychelles/news/undp-supports-launch-one-patient-one-record-ehealth-project-enhanced-public-healthcare.

16 World Health Organization, 'Digital Implementation Investment Guide (DIIG): Integrating Digital Interventions into Health Programmes', WHO, Geneva, 2020, https://www.who.int/publications/i/item/9789240010567.

UNDP's work on digital health for development contributes to the Pact for the Future and accelerating progress on the Sustainable Development Goals and the pledge to leave no one in behind. The UNDP Digital Health for Development Hub is a one-stop shop with technical, advisory and partnership support for the introduction and scale up of digital and AI for health as part of its HIV and Health Strategy 2022-25. UNDP is working across 89 countries to identify, adapt and scale up appropriate digital and AI solutions that strengthen health systems and improve health outcomes. The Hub focuses on strengthening policies, capacities and institutions in line with the UN Global Digital Compact and WHO guidance. The Hub also supports knowledge and learning on digital health for development and AI for health across its network of Country Offices, regional hubs and global teams.

Get in touch

If you're interested in knowing more, or to partner with us, please contact us at:

Amanda Serumaga, UNDP Resident Representative for the Mauritius and Seychelles Country Office, amanda.serumaga@undp.org

Renooka Beejan, Head of Socio-Economic Development Unit, UNDP Mauritius and Seychelles, renooka.beejan@undp.org

Manish Pant, Policy Specialist Digital Health, HIV and Health Group, Bureau for Policy & Programme Support (BPPS), manish.pant@undp.org

Ketki Bhatia, Program Analyst Digital Health, HIV and Health Group, Bureau for Policy & Programme Support (BPPS), ketki.bhatia@undp.org

𝕏 @UNDPHIVHealth