

## **Afghanistan Polio Management Information System Phase 2 Development Consultant(s)/Contractor(s): Call for Proposals/Applications**

### **Background:**

Afghanistan and Pakistan are the last two countries in the world where wild polio virus transmission still occurs. The [Global Polio Eradication Initiative](#) (GPEI) is a public-private partnership led by national governments with international partners with the goal to eradicate polio worldwide. GPEI works with the Government of Afghanistan Ministry of Public Health on polio eradication activities in Afghanistan. Routine national vaccination campaigns are conducted to reduce the number of children susceptible to polio infection and thus prevent disease incidence. Campaign monitoring data are a critical tool to evaluate the effectiveness of campaign activities and understand programmatic challenges.

The Afghanistan Polio Management Information System (APMIS) is an online data system for inputting, storing, managing, and visualizing monitoring data of polio immunization activities in Afghanistan. The goal of APMIS is to provide a simple to use, but flexible and powerful platform for polio campaign monitoring data and its use for public health decision making.

### **Project Team:**

- TEPHINET and CDC staff who contribute both technical and logistical support

### **Project Overview and Needs/Objectives:**

#### **Existing System**

[APMIS](#) is a modified version of the open source [SORMAS platform](#). The system includes the following general features:

- Data input via web browser
- Data import tool via formatted csv
- Data export to csv
- Set up and manage attributes of campaigns of field activities
- Set up or modify web data entry forms using JSON file imported into APMIS
- Visualize data in bar and column charts from [Highcharts](#)
- Customize layout of basic dashboard (charts summarizing campaign data)
- Configure population data in the system for denominators
- Configure and import infrastructure data for geographic administrative units (regions, provinces, districts and clusters)
- User management: add users, configure rights, reset passwords
- Android 7.0+ (Nougat OS and above) mobile tool for offline inputting and editing of data
- REST API endpoint for connectivity between web and mobile app
- Support for multiple languages: English (Afghanistan), Pashto, Dari

#### **Technical Summary**

APMIS shares its basic technical details with [SORMAS](#) which is available in [GitHub](#).



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- Open source
- Java
- PostgreSQL database
- Vaadin UI framework
- Angular JS
- REACT JS
- UI/UX design framework

### **Program Needs**

It is essential that APMIS is implemented and developed as a system that enables and empowers the country to make use of their data. The country shall own the data within the system as well as control its design. The project is based on a user-centric methodology whose design must reflect the wishes and needs of the stakeholders and leadership in country, as well as consider the primary user experience. The expectation is for a high level of developer engagement and an iterative, agile process that allows for responsive and timely development, refinement, and implementation of feature requests. The data contained within APMIS must be stored with interoperability and HL7 and ISO standards in mind to allow for use externally and in conjunction with systems like [DHIS2](#), [XMART](#), [POLIS](#) and other public health data repositories.

Afghanistan represents a challenging context for project implementation compared with many other settings. Experience with mobile and web application development for resource-poor or conflict settings is a significant advantage. Such setting-specific challenges can include potential inability to conduct on-ground support for users, poor/sporadic internet connectivity or periodic scheduled network shutdowns, users with limited database experience or educational background, conflict-related community sensitivities to certain technologies (e.g. smartphones, GPS), limited ability to implement in some areas or a changing geopolitical situation.

APMIS has been developed as a pilot project and requires further feature development to serve the needs of the program. Based on feedback about the pilot data system, there are six general areas of need:

1. **Feature development**: Developing specific multi-layered user-requested features requirements identified during the pilot phase
2. **Strategic input**: Providing expert technical and strategic input on core technical decisions and guidance on overall project roadmap
3. **Ongoing development support**: Supporting ongoing refinements and new features as defined by stakeholders during adoption of the system
4. **Hosting administration**: Managing a secure cloud hosted installation of the data system
5. **Interoperability Framework**: Set up an API endpoint and data access points to other systems from APMIS and vice versa
6. **Mobile App**: Ongoing support for mobile app revisions, customization and REST interface in accordance with changes to the web-based data system

Close coordination and collaboration with the current development team and/or hosting service will be expected to support and execute an efficient transition and facilitate the above six areas of need.

## **1 - Feature Development**

The following features are known requirements as of project kickoff.

- Ensure support for common data types during entry and storage (integer, decimal, categorical, date, Boolean, GIS, etc. in line with common standards) ([github.com](https://github.com))
- Support for basic logical checks on input (range checks, agreement between fields) ([github.com](https://github.com))
- Ensure support for common data input web controls during entry (text box, dropdown, yes/no, radio button, check box) ([github.com](https://github.com))
- Ensure support for calculations within data entry pages/forms based on entered data within that form
- Add ability to duplicate campaign configurations from an existing campaign to a new one (i.e. copy a previous campaign's configuration and rename)
- Enable APMIS to pull data from external systems' APIs and display within APMIS (e.g. UNICEF's dashboard)
- Remove or disable specific irrelevant SORMAS components and references
  - Remove all other irrelevant languages and retain only English (Afghanistan), Pashto, Dari
  - Irrelevant user roles
  - Other items as needed
- Enable secure root access to database (e.g. DBconnect) for linking to external reporting systems (e.g. R/power BI)
- Create new flexible form builder component- Add simple screen for building data input forms via GUI (flexible form builder component based on existing JSON forms and ability to create, duplicate new forms)
- Support for input and display of GIS data (e.g. microplan map info, inaccessibility map)
- Modify the SORMAS mobile app to remove persistent references to "SORMAS" and show APMIS branding
- Provide version number for APMIS updates which is independent from SORMAS
- Provide for server-side integration of R Shiny support for advanced visualizations (e.g. temporal campaign-level data). Describe approach to preserve relevant user permissions
- Expand About section to allow for linking to reference material (e.g. help files/online documents)
- Manage the forked branch of APMIS on Github and any other push/commit, and version releases of APMIS based on development while integrating any other system updates from the CORE (SORMAS) relevant to APMIS
- Allow for a flexible screen resolution display on mobile, web or tablet screens with automatic adjustments with scroll bars where needed and responsive

## **2 - Strategic Input**

- Review and recommend based on existing system code and architecture
- Provide proposal on Phase 2 design choices to achieve known specific feature requirements and anticipated thematic program needs. Describe considerations including regarding forking from SORMAS and adapting current code in these potential scenarios
  - Maintain current integration with SORMAS, or
  - Diverge from current dependency on SORMAS and rebuild as necessary to achieve project goals, or
  - Fork from SORMAS and support as independent project, in which case, manage the forked branch of APMIS on GitHub and any other push/commit, and version releases of APMIS based on development while integrating any other system updates from the CORE (SORMAS) relevant to APMIS
- Support assessment of in country resources for managing system and advise on path to long term goal of transitioning to local management of system
- Liaise with other stakeholders and partners as necessary to understand related systems and feedback

## **3 - Ongoing work**

- Utilize feedback from users to define new requirements, changes to the data system as needed



- Anticipated areas of work include, and are not limited to:
  - Expand data collection to include additional form types or non-campaign data
  - UI/UX changes: menus, basic navigation, look and feel (responsiveness)
  - Build QA tools to query or identify submitted data that meets specific criteria
  - Support for basic map data
  - Enhance degree of control of user permissions
  - Allow users to reset passwords
  - Enhance mobile app features
  - Refine data import/export tools

#### **4 - Hosting**

- Set up and configure a new APMIS instance on Linode or similar service
- Serve as point of contact for hosting administration and oversight
- Ensure database security, data confidentiality and cloud server protection
- Manage and maintain automatic backups, disaster recovery and server release updates
- Provide credentials for accessing the PostGreSQL database
- Develop, as needed, plans to migrate system to hosting resource preferred by country
- Install updates to APMIS software in the cloud hosted system as needed without regard to SORMAS schedule of updates

#### **5 – Interoperability**

- Set up an API endpoint and data access points to other systems from APMIS and vice versa
- Utilize the existing HI7 FHIR adapter for SORMAS Core to develop an interoperability framework from APMIS to DHIS2 FHIR adapter using agronautic profiles (APMIS-DHIS2 data transfer)
- JSON mapping console for linking relational variables within the defined database (PostgreSQL in our case)
- JSON Map builder component display on the dashboard (inaccessibility maps) for geo series ([Angular Map | Data Visualization Tools | Binding JSON Files | Infragistics](#)).
- As for the API endpoint (post JSON to a REST API endpoint)- JSON and XML data transfer via REST API endpoint POST /echo/post/json HTTP/1.1
- JSON and XML data transfer via API endpoint from APMIS to other systems (UNICEF Dashboard, Hub Dashboard, PowerBI)
- Tableau, R Shiny/ Restful API Communication (Accessing RESTful API Using the R Language)

#### **6 – Mobile App**

- Revise mobile app as needed to work in conjunction with web-based data system
- Perform testing of mobile app to ensure quality assurance and functionality
- Make relevant UI/UX changes as requested by country
- Develop mobile framework for migrating existing REST interface to Xamarin (For flexible Android/iOS apk builds)

#### **Project Management**

- Conduct Agile project management approach to allow for iterating feature requests and product attributes based on user and stakeholder feedback
- Define requirements, dependencies and milestones for project period.
- At minimum, weekly update meetings unless cancelled by hiring group
- Except in the event of holidays or scheduled downtime, a response to queries from the hiring group is expected within 24 hours



# TEPHINET

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- Oversight of project including platform to catalog and classify development issues
- Consultant/firm is expected to conduct testing and quality assurance of their work
- Product developed to have error handling and descriptive error notifications for users using Github and Slack
- Product warranted for bug fixes post-deliverable for 6 months after a defined and mutually agreed upon freeze period for defined features.
- Maintain open-source status of software and relevant online code references (e.g. GitHub)
- Support user trainings as necessary

## Requirements:

- One to two dedicated consultants or a team of staff sharing time with appropriate expertise dedicated to this project
- Availability to engage with the APMIS team regularly and as needed
- Flexible and able to adapt to new input beyond the known feature requirements at this time

## Contract Period: July 2021 – September 2022

- The selected candidate/contractor will be expected to start in July 2021.

## Application Process:

- **Who can apply:** Contractor organizations/firms or independent individual consultants with experience achieving the above desired outcomes. Experience working on collaborative projects (especially in the field of public health) in international, low-resource settings is preferred. Preference will be given to a US-based organization or individual.
- **When to apply:** Applications will be accepted on a rolling basis until the candidacy is fulfilled.
- **Required documents for submission:**
  - Background/qualifications (CV, organizational profile; relevant portfolio samples)
    - Please include a description of work on related data systems in resource-poor settings, if applicable
    - Please include description of implementation approach and project management structure on similar programs, if applicable
  - Proposed approach responding to the expected terms of reference described
  - Proposed Work plan (including estimated timeline, budget and work products). Please note that a mixture of deliverables-based work and time-and-materials-based work up to an agreed upon ceiling price is currently envisioned.
    - Please include proposed project management structure/organization for achieving the goals of the project
- **How to apply:** Please submit required documents and/or any questions you may have to Claudia Moya, Project Coordinator, at [cmoya@taskforce.org](mailto:cmoya@taskforce.org). Please copy (cc:) Molly Tutt, Project Manager, at [mtutt@taskforce.org](mailto:mtutt@taskforce.org) and Amanda Creary, Project Coordinator, at [acreary@taskforce.org](mailto:acreary@taskforce.org) on the email.