

Request for Proposal

1. Statement of Business

PATH is the leader in global health innovation. An international nonprofit organization, we save lives and improve health, especially among women and children. We accelerate innovation across five platforms—vaccines, drugs, diagnostics, devices, and system and service innovations—that harness our entrepreneurial insight, scientific and public health expertise, and passion for health equity. By mobilizing partners around the world, we take innovation to scale, working alongside countries primarily in Africa and Asia to tackle their greatest health needs. Together, we deliver measurable results that disrupt the cycle of poor health. Learn more at www.path.org

PATH is seeking an **information technology vendor(s)** to support Viettel in fixing current bugs related to the reporting module of the National immunization information systems (NIIS) and to develop mobile applications for both Android and iOS phones or tablets to support health workers using smartphones or tablets to perform basic functions: e.g. enter data, track clients for vaccination, etc., as detailed in the user requirements document in the annex of this RFA. The vendor(s) will be expected to work collaboratively with Viettel, National Expanded Program on Immunization (NEPI) and Vietnam Ministry of Health (MOH) to apply Health Level 7 Fast Healthcare Interoperability Resources (HL7 FHIR) health data exchange standard, to develop the NIIS mobile app. The HL7[®] FHIR[®] standard defines how healthcare information can be exchanged between different computer systems regardless of how it is stored in those systems.

2. Scope of Work

2.1 Objective

- To support Viettel in fixing recurrent bugs related to the reporting module of the NIIS during the implementation of this project.
- To develop mobile applications for Android and iOS to support health workers entering immunization and inventory data by smartphone and tablet.

2.2 Responsibilities

- Work with PATH, NEPI and Viettel to understand on-going bugs related to the reporting module of NIIS and business needs.
- Work closely with PATH and NEPI from the design to development phase to well understand the business needs and functionality of the mobile apps based on the document of user's requirements.
- Develop mobile apps for both popular mobile phone operating systems (Android and iOS) to meet users' requirements described in the document of user requirements (see detail in the annex).
- Work with PATH and Viettel to apply HL7 FHIR data exchange standard for the development of smartphone application.

3. Application Requirements

The following is a list of significant criteria against which applications will be assessed. The criteria are listed in order of priority; however, they are not weighted.

- Technical approach that conforms to all of the components listed in this scope of work
 - Description of technical approach.
 - Timeline to meet the deliverables.
 - Identification of major internal and external resources.
 - Qualifications.
 - Profile of relevant experience and examples of related work.
 - Staffing plan accompanied by CVs for key technical positions.
 - List of certifications possessed by each key technical personnel.
 - Number of years in business.
- Experience - to be validated by past performance.
- Experience with health informatics standards (e.g. ICD, HL7 FHIR), open-source technologies, and open-source software development practices - to be validated by past performance references.
- Costs: Provide itemized costs for the total scope of this project, based on the scope of work and deliverables outlined in Section 2. The final scope of work may be subject to negotiation; however, bidder selection will be made against the original scope of work.

List of recurrent bugs are attached in the Annex 1.

User requirements are attached in the Annex 2.

4. Deliverables and timeline

The company is required to submit to PATH deliverables with timeline set below:

Item	Deliverables	Timeline
1.	Design/Mock-up of mobile app for both Android and iOS developed	15 Jul 2021
2.	The HL7 FHIR implementation guide developed	30 Sep 2021
3.	FHIR API for mobile apps is developed	10 Oct 2021
4.	The NIIS MobiApp for health worker that supports both Android and iOS developed	15 Oct 2021
5.	MobiApp source code handed over to PATH	31 Oct 2021
6.	User manual for the mobile apps is released and public via NIIS website and other channels	31 Oct 2021
7.	List of Bugs fixed	15 Jun 2022
8.	The technical document indicating the calculation of reports developed	15 Jun 2022

5. Summary of deadline

The expected schedule for this application is outlined in the following table. Note that PATH reserves the right to modify this schedule as needed.

Release of Request for Proposal:	22 April 2021
Confirmation of interest due:	29 April 2021
Fact-finding questions received by	06 May 2021
Response to the fact-finding questions	10 May 2021
Proposals due:	13 May 2021 at 5pm GMT+7 time
Selection of short-listed candidates	20 May 2021
Interviews with short-listed candidates	23-24 May 2021
Bidders notified of decision	28 May 2021

Proposals must be sent to vietnam@path.org and hle@path.org with subject line “Proposal: Mobile Application Development for National Immunization Information System”. Late applications will not be considered.

Note: Confirmation of this procurement is contingent upon donor funding.

6. Terms and Conditions of the Solicitation

A. Notice of non-binding solicitation

PATH reserves the right to reject any and all bids received in response to this solicitation and is in no way bound to accept any proposal.

B. Confidentiality

All information provided by PATH as part of this solicitation must be treated as confidential. In the event that any information is inappropriately released, PATH will seek appropriate remedies as allowed. Proposals, discussions, and all information received in response to this solicitation will be held as strictly confidential, except as otherwise noted.

C. Conflict of interest disclosure

Suppliers bidding on PATH business must disclose, to the procurement contact listed in the RFP, any actual or potential conflicts of interest. Conflicts of interest could be present if; there is a personal relationship with a PATH staff member that constitutes a significant financial interest, board memberships, other employment, and ownership or rights in intellectual property that may be in conflict with the supplier’s obligations to PATH. Suppliers and PATH are protected when actual or perceived conflicts of interest are disclosed. When necessary, PATH will create a management plan that provides mitigation of potential risks presented by the disclosed conflict of interest.

D. Communication

All communications regarding this solicitation shall be directed to appropriate parties at PATH indicated in Section VIII. A. Contacting third parties involved in the project, the review panel, or any other party may be considered a conflict of interest and could result in disqualification of the proposal.

E. Acceptance

Acceptance of a proposal does not imply acceptance of its terms and conditions. PATH reserves the option to negotiate on the final terms and conditions. We additionally reserve the right to negotiate the substance of the finalists' proposals, as well as the option of accepting partial components of a proposal if appropriate.

F. Right to final negotiations

PATH reserves the option to negotiate on the final costs and final scope of work and reserves the option to limit or include third parties at PATH's sole and full discretion in such negotiations.

G. Third-party limitations

PATH does not represent, warrant, or act as an agent for any third party as a result of this solicitation. This solicitation does not authorize any third party to bind or commit PATH in any way without our express written consent.

H. Proposal Validity

Proposals submitted under this request shall be valid for 90 days from the date the proposal is due. The validity period shall be stated in the proposal submitted to PATH.

Annex 1

List of recurrent bugs related to the reporting module of the NIIS

Reporting Form 01-01 (stock use report):

- The report does not count number of stocks used at lower facilities under management of district and province.
- The report does not count number of stocks in, out and used at hospitals under management of district and province.

Reporting Form 02-01:

- Discrepancy between report and input data regarding number of children vaccinated with proper number of shots to protect from polio virus as recommended by NEPI.
- Discrepancy between report and input data regarding number of children fully immunized with basic vaccines recommended by NEPI.
- Report is not able to query at provincial level up to national level or takes a long time.

Reporting Form 02-03:

- The report does not count number of children vaccinated against Hepatitis B or with BCG birth dose at hospitals under management of the district, province, region.
- Report is not able to query at provincial level up to national level or takes a long time.

Reporting form 03-01:

- Children vaccinated with pentavalent vaccine fourth dose (SI14) are not counted to the report.
- Children vaccinated with measles containing vaccine second dose and DPT fourth dose at 16 months of age (earlier than schedule recommended by NEPI) are not counted to the report.
- Children vaccinated with Imojev vaccine are not counted as 2 shots of Japanese Encephalitis.
- Cumulative total row is calculated incorrectly.
- Report is not able to query at provincial level up to national level or takes a long time.

Reporting form 04-01:

- Missing cumulative total row in the report
- List of clients vaccinated with tetanus vaccine exported in excel file does not show pregnancy status.
- Report is not able to query at provincial level up to national level or takes a long time.

Reporting form 04-03:

- Data are not aggregated at all levels (0 shows in all cells of the report)
- Missing cumulative total row in the report
- List of clients vaccinated with tetanus vaccine exported in excel file does not show pregnancy status.
- Report is not able to query at provincial level up to national level or takes a long time.

Reporting form for hospitals with maternal rooms:

- District and province level cannot see number of children/newborns vaccinated at maternal rooms.

Archived reports:

- Discrepancies between archived reports with real-time reports for forms 02-01, 02-03, 03-01, 03-03, 04-01 and 04-03

Annex 2
User Requirements for mobile phone applications for the
National Immunization Information System

i. Introduction

The National Immunization Information System (NIIS) has been introduced nationwide since 2017 in Vietnam. The system supports health workers in managing immunization subjects, especially children and pregnant women. Currently, the application has been developed on the web interface for computer use only, together with a barcode reader. Since most immunization facilities, especially commune health centers, have only one computer and only one staff member may enter data at a time during the immunization session, which is challenging for health worker and may cause data to be entered late.

With the booming of information technology as well as the high proportion of health workers using smartphones in Vietnam, the development and use of mobile applications in managing and updating information is essential to increase data quality and efficiency immunization management.

ii. Objective

This document describes users’ functional requirements on mobile application for health workers. This is a basic reference for software developers to choose technology, design the interface, and build up data connections when developing the application.

iii. Functional requirements

Since using mobile devices limits users’ activities/operations, the software needs to meet basic requirements of immunization staff such as:

1. To search and check for duplicate client records: quick search, search by QR code/barcode.
2. To view immunization list
3. To enter data following 4-steps procedure
4. To confirm vaccine dispatch, arrival, and use

iv. User requirements

1. Technical requirements:

Developed product is based on international standards of health information exchanges standard like HL7 and open-source architecture.

- The application must be able to run on two current popular operating systems which are available for mobile phones, including iOS from version 9.0 and Android from version 7 and above.
- Android application can use Google FHIR library: <https://github.com/google/android-fhir>.

2. Functional requirements

Account management

Account	<p>Log in: Use username and password that have been provided to each facility. Support login by fingerprint or face recognition if these functions are available on the mobile phone. One account can be logged in on many devices at the same time.</p>
	<p>Log out:</p>

	<p>There is a log out button to exit the application, when user clicks on the log out button, there should be a warning "Are you sure to log-out the application?" to avoid having to re-login by accidentally clicking the "log out" button.</p> <p>The software supports automatical log-out on each device if there is no action on the application after 5 minutes. Log-in status remains even when the phone screen is dimmed out within that 5 minutes.</p>
	<p>Update information:</p> <p>System allows user to update phone number and email address but does not allow to change facility's name. The function to change facility's name is in the facility management function and this account is managed by district and province levels.</p>

Search and check for duplicates

Function	Implement	Note
Search	Quick search	
	Search by scanning barcode /QRCode	
	Advanced search	

Confirm vaccine dispatch, arrival and use

Application allows health workers to confirm vaccine arrival/inventory from the upper level. As on the current web application, health workers can use mobile application to confirm vaccine arrival/inventory before doing 4-step process to ensure that the administered shot is connecting with relevant batch.

In the meantime, at the end of immunization session, health workers can generate vaccine use form based on the immunization results, similar to the function of creating a dispatch note from the vaccination list.

Data entry following 4-step procedure

<p>4-step procedure</p>	<p>At the welcoming step: health staff use mobile phone application to search for children in the appointment list or already registered on the system, but not listed at the facility by 2 ways:</p> <ul style="list-style-type: none"> - Scan barcodes/QR codes to find subjects => Currently, the system only allows to print barcodes, but not QR codes. The current limitation is that barcode label can be only read perpendicularly with the mobile phone camera or barcode reader. For QR code, this limitation can be resolved. - For children who do not have barcodes/QR codes, the application allows health staff to manually search using the following information: <ul style="list-style-type: none"> ○ Name of children or name of caregiver (no matter if in uppercase or lowercase letters) ○ Name of province, district, commune, and village ○ ID number ○ Date of birth ○ Gender ○ Telephone number of the children or caregiver
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	<p>For those who have not yet been registered in the system, the application allows for new registration, including information fields like on the web system for children group, pregnant women, and the rest subject group. Note: for pregnant women, it is allowed to add pregnancy time and date (last day of menstrual period).</p> <p>On the application, health worker is allowed to edit information of the children if there is any change in their personal information (name, address, phone number ...), to view immunization history and enter additional missing vaccination. Information is the same as on current web version.</p> <p>After the health staff finds the child/adds a new child, and updates the information, he/she can add the child to the appointment list for that immunization session, and then update information of temperature, weight, and height of child at this step if the facility provides those activities. Health workers then press complete button of welcoming step and move to the screening desk.</p> <p>The application shows the time of completion for the welcoming step.</p>
	<p>At screening step: children who have completed the welcoming step are listed in order, those who come first are put on the top of the list. The health worker in charge of data entry at the screening desk clicks on the first name on the list or can search by name, ID code or scan barcode/QR code to find the children given priority to get vaccinated first (newborns vaccinated at CHCs for BCG), the information input sheet by screening form will appear. If the information of body temperature, weight, height/length were entered from the welcoming step and displayed on the screen, health staff do not need to re-enter. If body temperature is measured at the screening table, the staff in charge of data entry at this step will enter it.</p> <p>The information on the screening sheet is entered at this step, and the application also allows the doctor to view children's immunization history, including vaccine name, antigen, date of vaccination, place of vaccination, and the adverse events following immunization (AEFI) related to that shot. In this step, the application also allows staff to add immunization history of injections that are not entered in the system, enter the vaccines ordered for this visit and press complete button of the “screening”.</p> <p>The application shows the time of completion for the screening step.</p> <p>Note: The application supports entering screening information for the upcoming implementation of covid-19 vaccination, according to the MOH form.</p>
	<p>At vaccination step: Children who have completed the screening step are listed in order, those who are screened first will be put at the top of the list. The staff in charge of data entry at vaccination desk clicks on the first name on the list or can search by name, ID code or scan the barcode/QR code to find the children given priority get vaccinated first, then clicks to select the correct child who has been screened, performs the specified vaccination and selects the correct batch of vaccine that has been administered for the child. Then he/she presses the completion button “vaccination” to move the child to the follow-up desk after vaccination.</p>

	<p>The application shows the time of completion for the vaccination step.</p> <p>At the post-vaccination follow-up step: children who completed the vaccination step are listed in order, those who completed the vaccination first are put on the top of the list, time of vaccination is displayed at the post-vaccination follow-up step to support health staff in monitoring children for a full 30 minutes after vaccination as regulated; it is necessary to make color highlight to know when the 30-minute follow-up is over.</p> <p>Before the child leaves, health staff will check body temperature and injection location to evaluate post-vaccination adverse events. If the child has no adverse events after injection, health staff presses the end button of “follow-up”. If the child has any adverse event, depending on the type of event selected (common, severe), the application will display the interface input form of the NEPI.</p>
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