Terms of Reference

Technical support in the implementation of the Immunization Digitalization Roadmap of the Kyrgyz Republic in terms of developing system components and modules

Background

In order to improve the efficiency of immunoprophylaxis of the population and automation of processes related to the vaccination of the population, such as: keeping records of vaccinations of individuals, accounting of available refrigeration equipment and the process of storage and transportation of vaccines, within the framework of implementation of the Presidential Decree "On urgent measures to develop the health sector and improve the quality of life and health of the population in the Kyrgyz Republic" dated February 8, 2021 UP № 23, MoH Order № 1749 of December 30, 2021 put the "Immunization - iEmdoo" information system into pilot operation across the republic.

Order No. 244 of the Ministry of Health of the Kyrgyz Republic dated March 6, 2023 approved the "Immunization Digitalization Roadmap of the Kyrgyz Republic" (hereinafter - the Roadmap), which aims to develop and implement digital solutions to ensure accurate and timely registration, data collection and analysis, as well as maintenance of personalized records for tracking and follow-up of the target population to be vaccinated.

The Roadmap reflects the following main tasks:

(i) Replacing existing paper-based reporting with digital solutions (e.g., vaccination registers with individual vaccination cards to be used for aggregate reporting and to replace monthly reporting forms).

(ii) Implementation of new technologies (e.g., utilization of functionality for ordering vaccines, consumables, and other needs in the information system).

(iii) Integrating different digital platforms into one comprehensive solution (e.g., integrating epidemiological surveillance of vaccine-preventable diseases into a vaccination database to analyze the causes of outbreaks).

In order to implement this Roadmap, the WHO Country Office will support the development of a number of components and modules related to the iEmdoo and Sanarip Clinic systems. For this purpose, the WHO Country Office needs an implementing company with experience in developing software products in the Kyrgyz Republic health system, which, under the guidance of the eHealth Centre, will be able to implement a number of the following tasks within a limited timeframe.

Objectives of the assignment:

1st set of tasks:

- The design of the vaccination certificate form developed in accordance with the immunization calendar, containing basic patient data, information on vaccinations (including the type of vaccine, vaccination dates and doses).
- Service in the information system "iEmdoo" developed, which will allow generating digital vaccination certificates in accordance with the immunization calendar, equipped with a protective QR code.
- The design of the COVID-19 vaccination certificate form developed, containing basic patient data, information on the vaccinations performed (including the type of vaccine, vaccination dates and doses).
- A service developed in the "iEmdoo" information system, which will allow generating digital certificates of vaccination against COVID-19, equipped with a protective QR code.
- The design of the certificate form with mantoux test information output developed.
- A service developed in the "iEmdoo" information system, which will allow generating digital vaccination certificates with mantoux test information.
- A service developed to generate a digital vaccination certificate in accordance with the immunization calendar for citizens on the Public Electronic Services Portal and in the "Tunduk" mobile application. The service to be published in the "Tunduk" catalogue.
- A service developed to generate a digital COVID-19 vaccination certificate for citizens on the Public Electronic Services Portal and in the "Tunduk" mobile application. The service to be published in the "Tunduk" catalogue.
- A service developed to generate a digital certificate of vaccination in accordance with the immunization calendar for identified users of mobile wallets of banks and cellular operators. The service to be published in the Tunduk catalogue.
- A service developed to generate a digital COVID-19 vaccination certificate for identified mobile wallet users of banks and mobile operators. The service to be published in the Tunduk catalogue.

Implementation period - within 20 working days from the date of signing the contract (with subsequent payment of 30% of the contract value)

2nd set of tasks:

- Developed design of the mother and the newborn exchange card in the "Sanarip Clinic" IS in terms of immunization.
- Developed module for the formation of the mother and the newborn exchange card in the "Sanarip Clinic" IS in terms of immunization.
- Filters developed for a global search of exchange cards.
- Integration of the "Exchange card" module with the "iEmdoo" information system for the automatic transfer of information about the vaccination of the newborn by the number of the medical birth certificate.
- Integration of the "Exchange card" module with the "Digital medical certificate of birth and death" information system for the automatic transfer of information about the newborn and mother by the number of the medical birth certificate.

- Integration of the "Exchange card" module with the digital inpatient record of the "Sanarip Clinic" information system for the purpose of automatic transfer of information about the mother and the newborn to the exchange card in terms of immunization.
- The "Exchange Card" module integration with the "Assigned Population" database of the "Sanarip Clinic" information system in order to automatically determine the place of registration of the mother in labor and organize the sending of exchange cards to the relevant primary health care organizations.
- Developed functionality for attaching/assigning a mother and a newborn to primary health care organization through the exchange card module.
- Developed design of analytical dashboards to visualize information about exchange cards in the national BI platform (bi.med.kg) in terms of immunization.
- Automatically generated dashboards developed to visualize information about exchange cards in the national BI platform (bi.med.kg) in terms of immunization.

Implementation period - within 20 working days after completion of 1ˢᵗ set of tasks (with subsequent payment of 30% of the contract value)

3ʳᵈ set of tasks:

- The text of PUSH notifications in the field of immunization developed.
- A directory of PUSH notifications developed in the iEmdoo information system, associated with the immunization calendar.
- A functionality developed for automatically sending PUSH notifications several days before the scheduled vaccination.
- A functionality developed for suspending the sending of PUSH notifications in the event of a patient's death, through integration with the Digital Medical Certificate of Birth and Death information system.
- A service developed and published in the Tunduk catalog for the purpose of transmitting PUSH notifications to authorized users of the Tunduk mobile application.
- A service developed for the possibility of integrating and sending PUSH notifications of mobile applications of banks and mobile operators.
- A functionality developed for suspending the sending of PUSH notifications in the event of a refusal or medical exemption.
- Analytical dashboards on sending PUSH notifications developed and published in the national BI platform (bi.med.kg) displaying the following analytical data: Information on the number of PUSH notifications sent by date, information on vaccination cards created, total coverage by recipients of PUSH notifications.

Implementation period - within 20 working days after completion of 2ⁿᵈ set of tasks (with subsequent payment of 40% of the contract value)

Deliverables

D1: Report on completion of 1st set of tasks and Acceptance by e-Health Center (MoH)

D2: Report on completion of 2nd set of tasks and Acceptance by e-Health Center (MoH)

D3: Final Report on completion of all 3 set of tasks and Acceptance by e-Health Center (MoH)

Technical requirements

Technologies:

- Programming language: C#
- Platform: .NET Core
- Database: PostgreSQL
- Frontend: Vue.js.
- Web-services and API: RESTful API.

Security and data protection:

- All data transmitted and stored in the system must be protected using modern security standards.
- Use of authentication through secure mechanisms.
- Protection of services from SQL injections.
- Measures to prevent automated queries.

Performance and scalability:

- The developed components and modules must be adapted to possible high load, support scalability for processing large amounts of data (for example, requests for generating certificates).
- Using caching to improve performance.
- Ensuring stability, load balancing and fault tolerance of the on-prem system installed in the internal data center.

Integration with external systems:

- The systems must be integrated with the Public Electronic Services Portal and Tunduk mobile application using secure APIs.
- Use of the HTTPS protocol to ensure the security of data exchange between the developed modules of the system with users.
- The system must be compatible with the current information systems of the Ministry of Health of the Kyrgyz Republic and other state platforms such as Tunduk, iEmdoo, Sanarip Clinic, as well as with mobile applications of banks and mobile operators

Code quality:

- The code must be written in compliance with clean code principles.
- It is necessary to provide unit tests using modern testing methods..

Support:

- Maintenance of the information system for 1 year.
- Assistance in detecting errors in the system based on monitoring the functioning of the system, including analysis of logs and performance, if necessary

Qualification requirements for the organization

Experience:

At least 3 years of relevant experience in the following areas:

a) Development and management of complex and efficient databases.
b) Development of efficient information systems.
c) Development or implementation of a health information system used by health organizations throughout the Republic.
d) Development and implementation of health information systems for the Ministry of Health of the Kyrgyz Republic
e) Experience in designing, developing and implementing health information systems, including solutions for managing medical data, monitoring and ensuring data security and interoperability with existing health systems.
f) Experience in developing services for citizens on the Public e-Services Portal

- Experience of working with WHO or other international organizations related to health shall be an asset.

Skills/knowledge:

- Thorough knowledge of health information systems in Kyrgyzstan
- Ability to deliver clean and efficient code

Other requirements:

- Ability to conduct at least 2 on-site visits to medical institutions in Kyrgyzstan to collect the necessary information. Such travel expenses must be included in the financial proposal
- Documentary support for the work performed within the framework of the assignment (development of guidelines, directives, standards, technical conditions, draft orders of the Ministry of Health, etc.).

Languages:

- Representatives of the organization shall be fluent in Russian
- Representatives of the organization shall be fluent in Kyrgyz