Terms of Reference

ELDERLY CARE WITH REMOTE MONITORING IN THE MUNICIPALITY OF DELCHEVO/NORTH MACEDONIA

Monday, 18 March 2024

I   Introduction

1   Project Background

In the framework of the BACID Program - Building Administrative Capacity in the Western Balkan and Moldova, with funding from the Austrian Development Cooperation and implemented by the Austrian Association of Cities and Towns (AACT) and KDZ – Centre for Public Administration Research (KDZ), in cooperation with NALAS - Network of Associations of Local Authorities of South East Europe (NALAS), an Elderly care with Remote monitoring in the Municipality of Delchevo/North Macedonia will be developed. KDZ and NALAS are committed to promoting municipal digitalization and smart city system implementations for the improvement of the quality of life of the citizens. This is key to improving the quality of local government policies and reforms, encouraging increased accountability, and facilitating citizens' engagement in policymaking.

The City of Delchevo is an administrative, medical, and educational centre of the Delchevo Municipality that has over 20 rural populated places, total population of 15.000 and covers area of 423 км^2. The main identified challenges are the connectivity and mobility of citizens from the rural area and providing equal services for every citizen in rural and urban areas. Main challenges in service provisions are social care services and health care for elderly population, mainly due to lack of primary health care providers and lack of sufficient public transport infrastructure limiting their mobility.

This initiative for a Smart City project is for the implementation of an Elderly care with remote monitoring system based on the innovative principles for tele-medicine and use of the existing GSM network coverage. The core objective is to revolutionize health care and social care services for the elderly population and enhance quality of service delivery outside the urban area. The system, is designed to provide real-time information on vital medical parameters of the elderly people that will be monitored by health care provider using a sophisticated equipment and network comprising displays with user-friendly interfaces. The project implementation is linked to the intention of the municipality to create an ecosystem of involved stakeholders: municipal administration/departments in charge of social services, local economic development and PR, together with the social service providers and primary health care providers.

This Smart City project encourages innovative solutions by allowing equal and quality delivery of services for all citizens, elderly, in rural or in urban areas. By identifying specific needs and conditions of elderly citizens monitored remotely, health care providers will be able to make better diagnostics and treatment, as well as supply with medication.

The immediate goal is to support elderly population in rural municiaplities and without public transport infrastructure and mobility options to provide innovative health and social care services, minimize risks of poor medical care and late diagnostics or treatment needs identification.

2   Objectives and Expected Results

The objectives of the Smart City project are to improve service delivery to remote areas, mainly to elderly population by adopting an intelligent, smart, and innovative approach such as tele-medicine.

- The project will support one of the planned interventions in the social sectors by innovation consequently enhancing the quality of social health services for minimum 100 elderly citizens. With this innovative and SMART solution the coordination among the several local institutions/organizations that provide elderly care services in the city will be improved. It will have the greatest effect for the elderly citizens in more distant and remote rural areas where there is a lack of primary health services and during the winter times, the visit to the doctors in the city is not accessible.

- Main benefit from this innovation is that by the available coverage of the GSM network, medical data transfer from the elderly citizens to their health care providers will be done in real-time and initiating treatments will be possible without visit to the doctors. It will also trigger the activities of other organizations involved in the municipality social services for delivering necessary medication to the citizens, such as the licensed social care service providers.

- In time of digitalization and available coverage with GSM network connectivity, but lack of physical connectivity and mobility of the elderly citizens, municipality will be using innovative ways to support the social health activities and provide improved services for elderly citizens.

- This system will be the pioneer in municipal innovative social services in the whole country and will link several institutions performing social health services. Elderly citizens will be provided with professional health service without leaving the comfort of their home.

The following results are expected to be achieved:
Expected results from the project with the specified objectives include:

1. Enhanced Support and Improved Quality of Assistance for the Elderly Population in Rural Areas:
Implementation of home monitoring devices and a central station facilitates revolutionary support for the elderly population in rural areas. Real-time monitoring of citizens' well-being from their residences enables proactive management of health concerns. Implementation of home monitoring devices and central station initiatives enhances the quality of assistance for the elderly population in rural areas. Focus on citizen needs and preferences fosters independence and dignity among the elderly population in rural areas, promoting their well-being and quality of life

2. Early Detection of Health Concerns:
Innovative monitoring methods enable early detection and identification of health issues, enhancing overall well-being management. Proactive management of health concerns contributes to improved health outcomes for the elderly population in rural areas.

3. Seamless Coordination and Communication:
The central station, situated in a healthcare facility, ensures seamless coordination and communication between support providers and citizens. Effective communication channels enable prompt response to emerging health issues, ensuring timely intervention and support.

4. Cost Efficiencies and Resource Optimization:
The project results in significant cost efficiencies and optimal utilization of resources at local level. Creating an ecosystem of relevant stakeholders at local level has impact in efficient resource allocation and ensures the delivery of high-quality care while maximizing the impact of available resources.

II Technical specification

BACID III project is supporting the Municipality of Delchevo to acquire a smart and innovative solution that is tailor-made to meet its unique needs and objectives, ensuring the efficiency, and effectiveness of the system while fostering equal quality of service delivery to elderly citizens in rural and in urban areas.

The main functionalities of the system are:

1- to remotely store data on vital medical parameters of elderly citizes and transmits data to the central station, respecting data security standards and regulations
2- to enable real-time monitoring of the individual medical parameters and display on an interactive user friendly display. This data will be used for evaluation medical condition, need for treatment of therapy.
3- To efficiently and effectively engage different local stakeholders involved in social care and health care services,
4- To create an ecosystem of stakeholders to enable equal and professional delivery of quality social and health care services to the elderly citizens in Delchevo.

1   Project Overview

This system will be the pioneer in municipal innovative social services in the whole country and will link several stakeholders performing social health services. Municipality has signed a letter of intent confirming their active involvement in coordination and engagement of stakeholders. Elderly citizens will be provided with professional health service without leaving the comfort of their home.

The Remote Monitoring and Support System shall be an innovative healthcare solution designed to revolutionize elderly citizen care and enhance accessibility to medical support. Consisting of a central station, cloud service, an intuitive user application for health data monitoring, and advanced remote monitors, this system will bring innovations in social and healthcare provision. At the core of the system shall be the remote monitors in homes of the citizens, and complemented by a central station equipped to process real-time health data. This sophisticated network shall communicate through secure data transmission, ensuring immediate updates on health parameters. The system shall be adaptable, supporting various user interfaces through a user-friendly application.

In time of digitalization and available coverage with network connectivity, but lack of physical connectivity and mobility of the elderly citizens, municipality will be using innovative ways to support the social health activities and provide improved services for elderly citizens.

2   Work Packages

In alignment with the project goals, a detailed set of requisites and technical specifications essential for the development of an innovative solution for service delivery are listed in Part3. These requirements are prepared to ensure the alignment of the system with the objectives of improving accessibility and fostering data-driven decision-making with remote monitoring. Please review the following requirements and technical specifications presented in subsequent sections, designed to facilitate the effective management and tracking of health-related parameters. The initial focus involves the establishment of a comprehensive infrastructure capable of handling the monitoring of

vital health indicators for a elderly citizens, ensuring the generation of detailed and structured data to support informed decision-making and optimize the delivery of remote monitoring services:

WP 1. Establishment of Comprehensive Elderly Database
– responsibility of Municipality

- Develop a localized database profiling elderly citizens requiring institutional support, with an initial focus on a designated rural area within the municipality.
- Identify and categorize specific needs, such as those living alone, facing illness, or having limited mobility.

WP 2   Establishing ecosystem of local stakeholders to be involved in implementation of the System and prepared inception report by the contractor– responsibility of Municipality and contractor

- Establish an internal system to monitor and track services, encouraging streamlined coordination among the Municipality, local licensed social service providers, Social Services Centre, and primary health care providers.
- Establish and enhance communication channels and information sharing among key institutions involved in social health services, citizens and the public
- Informing the contractor, NALAS and KDZ on WP1 and WP2 completion

WP 3   Acquisition and Deployment of Advanced Remote Monitoring Devices:
-responsibility of NALAS and KDZ and selected/elected contractor

- Procure user-friendly, advanced remote monitoring devices designed for elderly citizens.
- Enable real-time data transfer to a central station for health parameter monitoring by doctors.
- Facilitate immediate diagnostics and treatment based on data received from monitoring devices.

WP 4   Seamless Integration Between Citizens and Health Care Providers:
- **responsibility of selected contractor**

- Establish a seamless integration mechanism between citizens and health care providers.
- Secure data transfer

WP 5   Structured Training Program for Stakeholders:
- **responsibility of selected contractor**

- Conduct a comprehensive training program for municipal staff, social service providers, and health care providers.
- Equip them with the skills needed to deliver installation and handling of monitoring devices, enabling self-monitoring capabilities for elderly citizens.
- Provide targeted training for primary health care providers to evaluate received data, respond to abnormal values, and initiate further guidance and actions.
- Create comprehensive documentation for System, including user manuals, technical specifications, and troubleshooting guides.
- Facilitate knowledge transfer sessions to ensure municipal staff can maintain the system independently.
- Archive all project-related documentation for future reference and system maintenance.

WP 6   Installation and Integration of a Robust System:
- **responsibility of selected contractor and local stakeholders**

- Implement an integrated system featuring remote monitoring devices, a central station with specialized software at health care providers, and seamless connectivity between monitors and the central station.
- Ensure the effective delivery of services for elderly citizens in both urban and rural areas.
- Oversee the installation and regular reallocation of monitors in the homes of elderly, immobile, and seriously ill patients by trained social service providers.

WP 7   Real-Time Online Health Status Monitoring and Proactive Intervention:
- **responsibility of selected contractor and local stakeholders**
    - Analyze data received from monitoring equipment at primary health care facilities.
    - Enable institutions to actively monitor the health status of elderly citizens in real-time.
    - Enable citizens to receive medical advice and therapy without leaving their homes, emphasizing accessibility and cost-effectiveness.
    - Facilitate timely and proactive interventions based on health data, contributing to enhanced overall well-being.

WP8. Deployment and Integration:
- **responsibility of selected contractor and Municipality**
    - Roll out the Smart System in phases, starting with a implementation in a specific area.
    - Integrate the system with existing municipal infrastructure and services.
    - Monitor the deployment, addressing any challenges and ensuring a smooth transition.

3 Technical requirements

The technical proposal and system implementation must provide thorough descriptions of the following essential requirements.

3.1 System Capacity and Configuration:

I.   Ensure the system is capable of monitoring a minimum of 2 remote users, on one central station.
II. Ensure the system is connected through an LTE (4G) cellular network on the users' side and a fixed internet link via GPON (Gigabit Passive Optical Network) on the central station's side.
III. Describe if agreements with telco operators are required or active (with operating prices included) and if full coverage is provided.
IV. The following roles should be defined for system users:
    a. Health care Provider Role – for health providers that would operate the central station
    b. Operator Role - for Social service providers that would operate the remote monitors
V.   Equipment warranty is required for minimum 12 months.

3.2 Data Collection and Connectivity:

I.   Deployment of a Network for data transmission and collection is required.
II. At the central location there should be installed a fixed internet link with minimum speed of 100/20 Mbps Download/Upload, via GPON (Gigabit Passive Optical Network) technology.
-    The user equipment – router shall be installed as part of the service during the contract duration.
-    There should be 24/7 customer support via telephone.
-    The central location should have unlimited monthly traffic
-    The service should be offered for a period of 12 months.
III. At the remote locations there should be LTE routers installed with sim cards for providing connectivity via wireless cellular connection (4G).
-    The service should provide a download speed of up to 250 Mbps
-    The service should provide an upload speed of up to 50 Mbps
-    The service should be offered for a period of 12 months
-    There should be 24/7 customer support via telephone

3.3 Data Security

I.   All data exchanged between the Central Location and Remote Locations must undergo encryption directly on the device, enhancing the robust security measures implemented within our system. It is imperative to establish a secure network connection between the Remote Monitors and the Central Location. This stringent security protocol ensures that all data transmissions remain impervious to unauthorized access, upholding the integrity and privacy of the health-related information exchanged within the system.
II. The secure health monitoring system should be designed to adhere to EU data protection regulations

    III. All data transferred between the central and remote locations should be protected through a secure internet connection

3.4 Scalability:

    I. Mandatory system requirement is its scalability and expansion
    II. Ensure the system is capable of monitoring a minimum of 2 remote users on one central station to ensure scalability and expansion.

3.5 Time

    I. Maximum Remote Monitoring time should be 72 hours. History records should be stored and/or printed by the health care provider.

3.6 List of required technical specifications for the central station:

- All-in-one system
- Dual core processor no smaller than 1.6GHz
- Memory of processor should be 4GB DDR3
- Internal speakers with the opportunity for external speakers
- Display connections
- Ethernet connection
- USB connection
- Display port connection should be maximum 2
- Ethernet connection should be maximum 2
- Should have USB 2.0
- Should have USB 3.0
- Memory should be maximum of 256 GB SSD
- Monitor resolution should be maximum of 1920 x 1080
- Monitor should be 21.5 inches
- Should have brightness control
- ADT option (Admit/Discharge/Transfer)
- Alarms:
  - Quiet alarm option
  - Alarm on-display
  - 3 levels of alarm intensity
  - Alarm control
- On-display information
  - Demographic elderly citizen information
  - Arrhythmia
  - ECG
  - ST
  - SpO2
  - SpO2 rate
  - EMR

- o RR
- o CO2
- o Full disclosure
- o Numeric parameter information
- Should have an option to measure horizontal (time) and vertical (voltage) distances along historical waveforms
- Caliper measurements
- Real-time graphic trends should be maximum of 16 patients
- Display up to 8 waveforms per patient and multi-viewer capability
- Video output should have the option to be split into 4 remote views
- Scale and time for graphic trends: 1 min, 15 min, 30 min, 1 hr, 2 hr, 4hr, 8hr, 12hr, 24hr, 72 hr
- The central station should have licenses for at least 8 Remote Monitors simultaneously with a memory of 72 hours (full disclosure)
- Central station should be compatible with Remote Monitors
- Ability to display on the second monitor the following:
  - o History of arrhythmia
  - o Graphic trends
  - o Tabular vital signs
  - o Waveforms
  - o Numeric parameters
  - o ST overview
- Warranty should be minimum of 1 year

3.7 List of required technical specifications for the remote monitors:

- Monitor should be from 12 inches
- Monitor resolution (WXGA) should be min 1280 x 800 px
- Monitor control should be through touch and/or trim knob or equivalent
- Monitor parameters:
  - o Three and five channel ECG
  - o Resp
  - o SpO2
  - o NIBP
  - o Temp
- ECG
  - o Speed 12.5, 25 and 50 mm/s
  - o HR accuracy should be from 30 to 300 bpm or +/-5%
  - o Pacemaker detection should be in range of 2 to 700 mV
  - o ST segment analysis in numeric range should be from -9 to 9 mm and numeric resolution 0.1 mm
  - o ST trend (data storage) should be up to 72 hours
- SpO2
  - o Pulse oximetry should be from 1 to 100%
  - o Range of pulse should be from 30 to 250 bpm

- o Saturation with finger sensor should be in range of 70 to 100& with +/-3% precision
- NIBP
  - o Systolic Bp should be in range of 30 to 290 mmHg
  - o Middle range 20 – 260 mmHg
  - o Diastolic BP should be in range of 10 to 220 mmHg
  - o Max. time of measuring: for adults ≥ 125 seconds;
- Resp
  - o Range should be from 4 to 180 resp/min
  - o Precision: +/-5%
  - o Amplification range: 0.1 to 5 cm/Ohm
- Temperature
  - o Temp. range should be from 10 to 45 degrees Celsius
  - o Precision of measurement should be from +/-1 degree Celsius
- Monitor connection:
  - o USB port
  - o Call for nurse
  - o Additional monitor connector
- Alarm
  - o Audio and visual
  - o Alarm priority should be high, middle, low and message alarm
- Local patient data storage should be for up to 72 hours
- Working temperature should be for -20 to 60 degrees Celsius
- Lithium-ion battery should be with a 3 hour working period
- Monitor weight should be 4.5kg
- Monitor dimensions should be 280 x 320 x 150 mm
- Electrical supply shell of 100 – 240 V
- Must own CE certificate by directions of IEC 60601-1
- Warranty should be minimum of 1 year

3.8 Warranty period, Spare parts, and Maintenance requirements:

I. The offer shall include maintenance and warranty period of 12 months according to manufacturer warranty conditions.
II. Bidder should provide spare parts during warranty period, including periodic checks, to ensure continued reliable operation.

3.9 History and reports

I. Remote Monitoring history should be saved on the remote monitors and central station for up to 72 hours. In this period the doctor would be able to look at graphic and numeric trends from the vitals of the elderly citizen, as well as significant events recorded by alarms.
II. Recorded events describe abnormalities in the elderly citizen's vital signs and are shown on the central station.

III.   All trends within 72 hours can be printed out on paper for further evaluation.

IV.   After 72 hours are over or after a discharge has been made, all monitoring history should permanently be deleted from the local memory of the remote monitors and central station.

3.10 Alerts and Thresholds

Health Care Provider Role user should be able to define thresholds for minimum and maximum values of vital signs/parameters that are being monitored, upon deviation of which the device alerts the elderly citizen and the central station, i.e. the health personnel.

4   Outputs and Deliverables under the contract

The contractor shall cooperate with NALAS and KDZ in each stage of development, as per the agreed implementation methodology and time and action plan. In particular, the contractor shall provide KDZ and NALAS following outputs and deliverables according to the defined Work Packages

D1. Acquisition and Deployment of Advanced Remote Monitoring Devices

D2. Seamless Integration Between Citizens and Health Care Providers

D3. Structured Training Program for Stakeholders

D4. Installation and Integration of a Robust System

D5. Real-Time Online Health Status Monitoring and Proactive Intervention

D6. Deployment and Integration

NALAS will provide support in coordination between Municipality and contractor, if required by Municipality and or by contractor. It is required that the shared obligations are coordinated and NALAS to be informed in case of any obstacles or bottlenecks.

The period of delivery and implementation of the contract scope shall be 30 days after the contract has been signed and an official purchase order has been made.

III Invitation

Teams of individual consultants, businesses, or companies with proven experience and expertise in development of systems for Elderly Care with Remote Monitoring are invited to submit a proposal for these ToRs.

1   Proposal submission

The following format and sequence should be followed in order to provide consistency in the Consultant response and to ensure each proposal receives full and fair consideration. All pages should be consecutively numbered.

Technical Offer:
   a.   Title Page, showing Consultant name, address, and contact information;
   b.   One-page letter of introduction;
   c.   Table of Contents, including page numbers;
   d.   A presentation of the consultant and its suitability for the assignment;
   e.   A summary of the key features of the proposal;
   f.   The body of the proposal focusing on the methodology of the proposed approach, including: objectives, a detailed approach for the execution of the assignment, the rationale behind the proposal of different tools and options, proposed time and activity plan.

Certifications:
   g.   A presentation of a list of certifications of experts and or the company with standards for the system implementation, maintenance and warranty and compliance with EU standards.

Maintenance Requirements:
   h.   The offer shall include maintenance and warranty periods, including periodic checks, to ensure continued reliable operation.

Financial Offer:
   i.   The Financial Offer shall contain the total budget for execution of the contract, showing separately expert fees, costs for the purchase of additional external products and services, and additional expenditures (if any). The prices should be stated in Euros, VAT excluded, following the specified Terms of Payment.
   j.   The financial offer shall be divided into components in accordance with the Work Packages
   k.   The total budget available is limited to **30.000 Euros** (including VAT, reverse charging principles may apply if regulated by national legislation).

Organizational Capacity Guarantee:
   l.   Consultant Reference List with at least 3 similar smart city municipal contracts
   m.   CVs of the experts proposed to execute the assignment.
   n.   Documents confirming the financial capability of the consultant.

2   ToR Terminology

The following terms will apply to these Terms of Reference and to any subsequent Contract. Submission of a proposal in response to the ToR indicates acceptance of all the following terms:

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Terminology
  a) "KDZ" means Zentrum für Verwaltungsforschung (Center for Public Administration Research);
  b) "BACID Program" means the project 'Capacity Building in the Western Balkans and the Republic of Moldova',
  c) "NALAS" means the Network of Associations of Local Authorities of South East Europe;
  d) "Contract" means the written agreement resulting from the Request for Proposal executed by KDZ and the successful vendor;
  e) "Contractor" means the successful vendor selected from this Request for Proposal;
  f) "Must", "Mandatory" or "Required" means a requirement that must be met in order for a proposal to receive consideration;
  g) "Consultant" means a team of individuals or a company that submits, or intends to submit, a proposal in response to this Request for Proposal.

3   Closing Date and Application

To be considered, proposals must be received in email to NALAS no later than April 8th, 2024, at the following email address: info@nalas.eu, with subject "ToR: Development of Elderly care with remote monitoring'. The Technical and financial offer should be presented in separate as clearly marked documents.

4   Enquiries

This ToR can be downloaded from NALAS website at nalas.eu and BACID website at www.bacid.eu. Questions regarding this Request for Proposal should be directed to NALAS by e-mail to info@nalas.eu.

5   Ownership of Proposals

All documents, including proposals submitted in response to this Request for Proposals become the property of NALAS and KDZ. However, only the submissions by the successful consultant will be used. Once a contract has been awarded, the name of the successful consultant will be available to the public upon request.

6   Evaluation Criteria and Scoring

The evaluation of proposals will be undertaken by joint KDZ and NALAS Evaluation Committee. At the sole discretion of the Committee, a short list of the highest-scored consultants will be developed. The short-listed applicants may be invited to make a presentation to the Committee. After the presentation(s), the Committee will re-evaluate the short-listed proposals.
The proposals will be evaluated and rated based on the criteria set out in this ToR document. In order to do so:

- the proposal must be in English;
- the proposal must be submitted by the appropriate date and time;
- the proposal must clearly list, in detail, what services will be provided with the associated costs for each component;
- the responses must contain a list of references of past projects and work of similar smart city municipal project, with contact names and telephone numbers.

The Evaluation Committee will evaluate the proposals based on the following criteria:

- 40% Methodology, technical requirements, and approach – a work plan including the proposed method to accomplish the tasks identified in the ToR. Provide a brief description of your approach to execute the contract, including objectives, a detailed research approach including the tools planned to be used during the execution of the assignment and the rationale behind their use, proposed time and activity plan, based on the requirements provided in this ToR document, including explanation of any modification you would make.
- 20% Quality of the team - Appropriateness of the proposed consultants and fulfilment of the qualifications for the professional ability of the applicants in this ToR.
- 20% Previous Experience in undertaking similar work - indicate the number of projects of similar professional services and type or the number of projects of similar scale. Examples and samples of similar researches and other reports of a similar nature that have been prepared by the consulting company. Provide references from previous smart city projects including specific contacts and phone numbers.
- 20% Cost and Ability to Meet Deadlines - the Financial Offer with a total budget for execution, broken into different budget lines, expert fees, costs for purchase of external products and services and additional expenditures (if any) with associated timelines and a detailed explanation of the deliverables and services you will provide to KDZ. The prices should be stated in EUROS, VAT included, following the specified Terms of Payment in this ToR document.

7 Terms of Payment

The payment will be done in 2 instalments, first of 30% when the WP1 and WP2 are accepted and the second of 70% with the final delivery and confirmation by receiving documents signed by Municipality and contractor.

8 Consultant Expenses

Consultants are solely responsible for their own expenses in preparing a proposal and for subsequent negotiations.

9 Contract Negotiation

NALAS and KDZ reserve the right to negotiate specific terms of the contract with the short-listed proponents prior to the final award of the contract. NALAS and KDZ also reserves the right to negotiate specific terms of the contract with the Contractor as the contract progresses.

10 Logistics and timing

Location
The implementation of the project is at the location of Municipality of Delchevo, North Macedonia. The contractor is required to deliver and install the equipment at the location, but it may work remotely and travel as needed on a need basis. Coordination with NALAS and KDZ shall take place through online tools and in person meetings.

Start date and period of implementation
The period of implementation of the contract is from May 8th 2024 to July 31st 2024.

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11 Contractual Provisions

The selected Consultant - Contractor shall be contracted by KDZ-Centre for Public Administration Research as responsible implementing partner.
The final approval of deliverables shall be done by NALAS, KDZ and the Municipality.

Thank you for your interest in submitting a proposal. It is hoped that the information provided is of value and should anything be unclear, please contact NALAS directly.

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