



VIJAYAVAHINI CHARITABLE FOUNDATION

Supported by TATA TRUSTS

IOT System for Water Treatment Plants

1. PROJECT BACKGROUND:

Vijayavahini Charitable Foundation (“VCF”), a Section 8 Company supported by Tata Trusts, is a non-profit organization working across Andhra Pradesh in thematic areas like healthcare, livelihoods, nutrition, education, water and sanitation. One such initiative is to supply safe drinking water in remote villages of Krishna district, Andhra Pradesh. The primary objective is to develop a proof of concept to provide safe drinking water in select villages in Krishna District, through community based drinking water plants that are scalable and sustainable.

VCF intends to serve the communities in backward, high salinity and water stressed areas that do not have access to affordable, safe and purified drinking water, by setting up such Water Treatment Plants (“Plants”). The water treatment plant will be set-up on the land leased by the Gram Panchayat, and subsidized rates will be charged for the supply of treated water to the community, in order to make the project sustainable. 10 such water treatment plants, each catering to a catchment of about 1500 households, are planned to be set-up in the next 6 months. All the water treatment plants are planned to be equipped with a technology system, to enable automation of plant operations, to allow cashless transactions at water sale points and to provide detailed reports for data analytics.

2. SCOPE OF WORK:

VCF is looking to engage IoT partners (“Partners”) with a diverse range of experience and high level of expertise in the provisioning of IoT platform, application and devices for the water treatment plants. The Partners are expected to provide reliable end to end IoT services for the Plants, and bring excellent implementation capabilities, technical expertise and timely service support to the table. Supply of the necessary components and complete installation of the system will be in the scope of the Partner. Once the technology solution is installed, the Partner needs to establish best practices, standards, and an actionable process that will help VCF use the solution smoothly, without glitches. The Partner shall also do the necessary technology transfer to the VCF staff for handling operations and maintenance. The following components are to be included. The list may not be exhaustive and Bidders are encouraged to share additional components and features that can be incorporated in the IoT system.



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HARDWARE COMPONENTS:

- **Control Unit:** IoT device that controls the dispensing process against RFID cards complying to the features as detailed below
- **Power Backup:** UPS System (online power supply with 12V DC, battery back-up UPS & Batteries)
- **Dispensing Panel:** S.S Dispensing panel with 2 RFID slots (design shall meet the futuristic dispensing requirements of chilled water and bulk supplies) - Ref Fig 1 for Typical Panel Design
- **Flow control & Measuring Sensors:** Flow Sensors & Solenoid Valves (Automatic solenoid valves operating on 12V DC)
- **RFID Cards** with customized branding
- **Quality Monitoring Sensors:** Water Quality (TDS, pH) Sensors
- The Hardware components and control unit shall be compatible for integration with Water Treatment Plant pipelines, flows and communication.

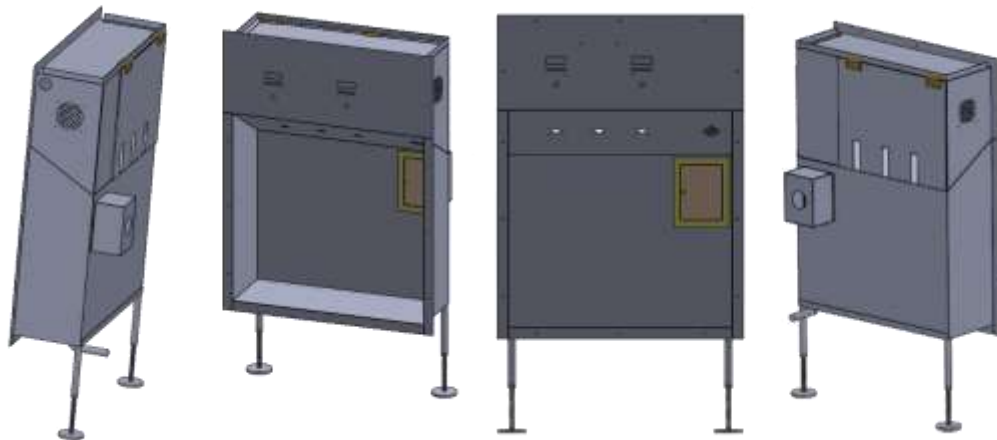


Fig 1: SS 304 Panel, with Two RFID Card Reader Slots,
Two Regular Dispensing slots and one bulk dispensing slot



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SOFTWARE COMPONENTS

- **Dashboard (in Software as Services Model):** The dashboard with due access controls shall be established for monitoring the operations of the project on a real time basis. The dashboard needs to capture data for all 10 locations where the plants are being set-up, as well as provide a drill down for specifics of each location. The Dashboard must have the following features:
 - Users/beneficiaries of each unit: Registration, Recharge, Card Blocking & New Card Issue, Card Unblocking, Chronological Transaction Data, Smart Card Categorization and Differential Pricing and the corresponding reports.
 - SMS Gateway to handle the communication related to user information & alert management
 - Integrate with the Mobile Application a) For handling Registration, Recharge of cards with QR Code, b) Agent/ Field Executive virtual money top up against bank deposits
 - Feasibility to link Identity Proof (Ration Card/ Aadhar data etc.) of the users at the field level during the initial registration process
 - Handle the Card Block and UNBLOCK features.
 - Shall expose and consume Web Services/REST API in order to integrate with other Portals/ Dashboards.
 - Designed to handle FOTA (Firmware over the Air)
 - Shall have inbuilt alert mechanisms with respect to the Key Performance Indicators as a preventive measure, Water Quality parameters, Functioning of the Unit
 - Shall raise Red Flags on specific deviations from operational deliverables
 - Flexible report generating system with the following types of reports over required time period and for a specific place (but not limited to)
 - Sales between dates
 - Registration report
 - Recharges and registrations
 - Card with limit balance – Balance available, Balance converted revenue
 - Cards with zero balance
 - Consumer information
 - Active and Inactive users
 - Transactions per unit
 - Unique users
 - The Date formats in the reports shall be in dd-mm-yyyy format
 - There shall be provision for in-built reconciliation/ audit process considering the offline transactionsThe system shall facilitate Invoice generation in excel and pdf formats



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- System shall generate Customized GST Reports
 - Reports should have viewing and download options with filters for periodicity, demographic, location etc
 - Agent/ Field executive related reports shall be generated with in-built audit system
 - Based on operational requirement additional reports shall be designed and delivered
 - Card recharge through multiple payment mode (Cash, Card, UPI, Wallets etc)
 - Dispensing by using RFID Card, Coin and UPI gateway
- **Mobile Application**
 - Required for handling end user Registrations, Recharges; agent transactions
 - The Agents/ representatives for every unit shall be provided with a unique ID and access to Mobile APP to handle end user related transactions.
 - The financial transactions between Agent and end user; organization and Agent shall be looped through the server for the audit process.

DISPENSING CONTROLLER FEATURES:

- System shall dispense water against encrypted (64 bit) RFID Card
- The RFID cards should be locked to function at respective villages/ group of villages only.
- The RFID cards are enabled with read and write option;
- Card BLOCK and Re-issue of Duplicate Card
- Registration & Recharge Process enabled through mobile/ server at Village Level
- System shall Dispense with multiple intervals to meet end user needs
- System shall Dispense independently during network failures
- Data acquisition on Real-time basis or specified time intervals
- Remote control operation of CIP (Clean-in-Place) Process
- SMS based Alert system based on preset deviations
- Differential pricing option for different types of consumers
- The System shall be compatible to FOTA (Firmware Over The Air) feature
- System shall handle the end user's RFID card recharge process using a QR CODE and integration with UPI payment gateway, if necessary with a mobile application developed to that effect. This feature objective is to make end users do self-recharge through the system.



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OTHER REQUIREMENTS:

The IoT platform needs to have following modules/ capabilities:

- Secured, modular/ scalable (should be robust)
- Supports different modes of connection (wired and wireless)
- Service integration (with legacy system, third party system)
- Device Management (manages a heterogeneous set of devices)
- Card recharge through multiple payment mode (Cash, Card, UPI, Wallets etc) should be allowed
- Data management (storage-processing massive amounts of data, BI)
- Self-service Portal (user management, reports)
- Subscription and Billing management (flexible packaging and pricing)
- Periodic Customization of Mobile Application and dashboard as per need.
- Ensures data security, confidentiality and accessibility
- Software should be configured for printability of the receipts, recharge slips, invoices etc.
- Compatibility with Bank Payment software /gateways with necessary integration and data security.
- The system should also have feasibility to integrate with coin based dispensing system.
- Warranty of 2 years on hardware components
- Free maintenance for the entire system for at least 1 year after the commissioning - As part of maintenance one standby unit shall be made available at our office and one more unit at the partners place to address any service challenges
- Any trouble shooting to be done within 24 hours after a concern is raised

3. PROCEDURE FOR SUBMITTING PROPOSALS

Companies with the ability to provide end to end technology solutions for the drinking water plants, including hardware and software, with a minimum of three years of experience in providing similar services are invited to participate. A detailed proposal needs to be sent via e-mail to scmvja@vijayavahini.org & washvcf@vijayavahini.org. The submittals must include the following:

Part A: Background of the organization, including experience in performing similar assignments in the part. Please provide work completion certificates and scope of the services provided in the previous assignment.

Part B: Technical proposal outlining the detailed list of offerings, specifications and components, as per the outlined scope of work

Part C: Commercial proposal, including base fees, AMC charges and GST



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Other conditions:

- The Bidder, if it desires so, at its own responsibility and cost may visit and examine villages/mandals in Krishna district and obtain all information that may be necessary for preparing the Bid.
- In case any clarification is sought with respect to the RFP, the queries may be sent to the email id scmvja@vijayavahini.org & washvcf@vijayavahini.org on or before the due date for seeking clarification
- The proposals shall be submitted within the due date mentioned 27th Feb 2020 for submission and any bid received after the deadline will not be considered.



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