Smart Choice for Smart Metering

Assure Sustainable Water Value with
LAISON Smart Prepaid Metering & IoT Data Solutions

HANGZHOU LAISON TECHNOLOGY CO., LTD

www.laisongroup.com

CONTENT

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PART 3 **Digital Billing System**

PART 4 **Typical Cases**

01

Creating Values through Continuous Innovations

PART ONE

Company Profile

Company Profile

LAISON, founded in 2012, is an innovation-driven enterprise specializing in the **R&D, production, sales, and service** of smart water metering and systems. With a global footprint spanning **over 30 countries**, LAISON has partnered with more than 70 water utilities, achieving **over 1 million meters installed** online.

Laison has multiple advanced smart metering solutions for both **Domestic and Commercial/Industrial** fields, together with **Hardware & Data Management System**, mobile payment platform and smart Apps, which aim to realize **Prepaid, AMR/AMI Remote Meter Data Collection, Water Leakage Detection** etc. functions, help water utilities to **improve cash flow, management efficiency, reduce historic debt and Non-revenue water (NRW)**, etc.

With over **130 patents and copyrights** and **70+ proprietary patents**, LAISON continuously drives innovation in the industry. We are dedicated to facilitating the digital transformation of water utilities, with a focus on improving operational efficiency and water supply services while promoting sustainable economic development through **the Internet of Things, big data, and AI** technologies in a low-carbon way.

Innovation | Collaboration | Focus | Agility

QUALIFICATIONS

OF COMPANY

- National High Tech Enterprise in China
- Awarded as The Leading, Professional and Innovative Enterprise
- ISO9001, ISO14001, ISO45001 certified
- MID 2004/22/EC for smart water meter
- OIML R49 Certified
- NRCS Type Approval for water meter
- STS Certificate for prepaid water meter
- LoRaWAN Certification of LoRa Alliance
- WRAS Certified
- 130+ patents and copyrights till 2024

1.3. Business Sectors

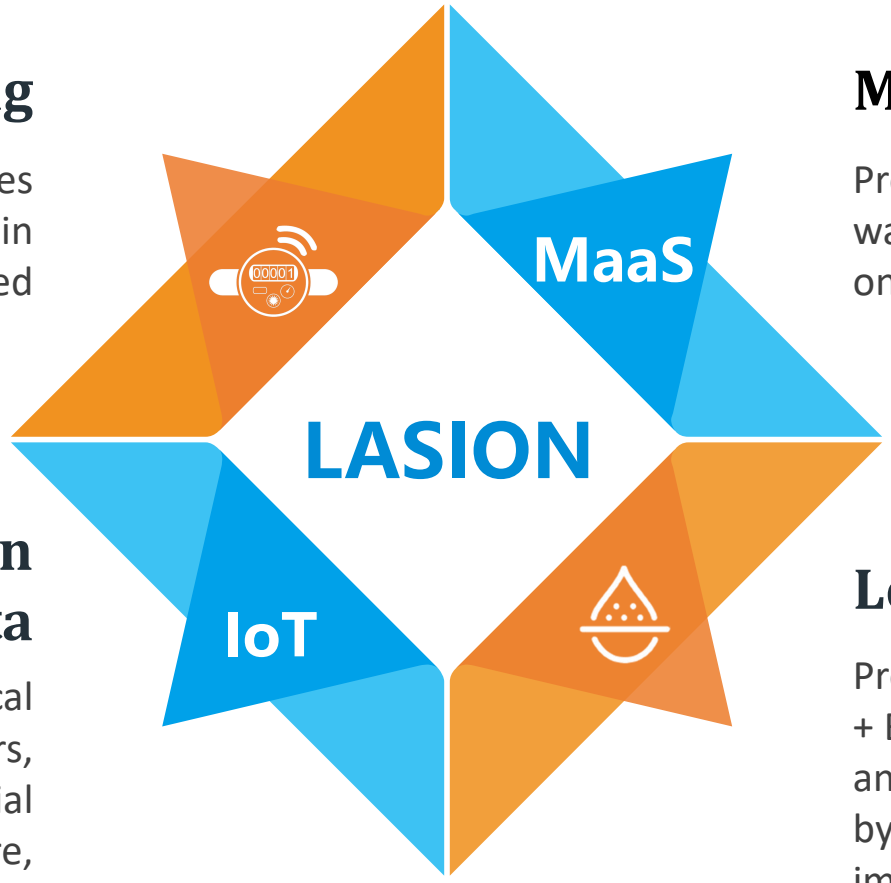
Aims to increase Water Revenue and Improve Operational Efficiency for Global Water Utilities by accurate measurement and fine operation services via digital solutions.

Smart Water Metering

Smart Water Metering, Accessories and other Intelligent Hardware in Water Filed

Metering-as-a-Service (MaaS)

Provides fine operation services for water utilities, either in subscript or once-off mode



IoT Communication O&M, Big Data

Derivative business cooperation with ecological partners such as communication operators, mobile payment platforms, and financial channels based on intelligent hardware, communication network and big data

Leakage Management

Provide leakage control services through IoT + Big Data + AI and other digital technologies, and share the economic benefits generated by production and sales gap/leakage improvement, debt recovery, etc.

1.4. Project Services

Comprehensive Lifecycle Services

- Technical Consultation
- Engineering Design
- Project Implementation
- Network O&M
- Training Empowerment






30+
Countries

70+
Water Utilities

20+
Metropolis Water Utilities


HCWW, EGYPT


NIGERIA

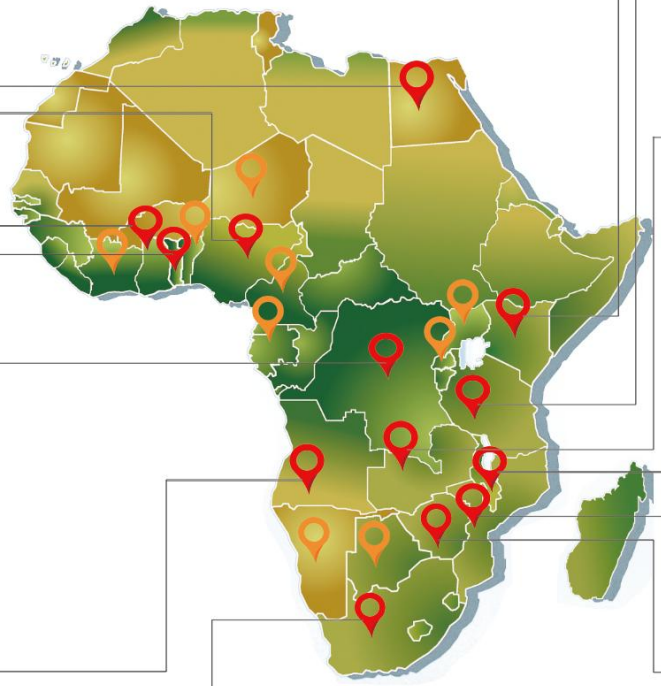

GHANA


TdE, TOGO


Congo


ANGOLA


SOUTH AFRICA



KENYA


TANZANIA


ZAMBIA


MALAWI


MOZAMBIQUE


ZIMBABWE


02

Creating Values through Continuous Innovations

PART TWO

Smart Water Metering

Main Content

2.1 LoRa/LoRaWAN Dual-Mode Ultrasonic Water Meter

2.2 PARISE IoT Online Smart STS Prepaid Water Meter

2.3 Bulk STS Prepaid Smart Water Meter

2.4 Bulk Postpaid Smart Water Meter

2.5 Meter Installation & Accessories

Product Portfolio

L'AISON

Electromechanical Metrology Products

1. Residential Meter

- IoT Postpaid Smart Meter

- Multi-jet Smart Water Meter

- Volumetric Smart Meter

2. Bulk Meter

- Bulk Postpaid Smart Meter

- Bulk Prepaid Smart Meter

Electronic Metrology Products

3.Ultrasonic Metrology

- Ultrasonic Prepaid Smart Meter

- Ultrasonic Postpaid Smart Meter

- Bulk Ultrasonic Smart Meter

4.Electromagnetic Metrology

- Electromagnetic Meter

2.1 LoRa/LoRaWAN Dual-Mode Ultrasonic Smart Prepaid Water Meter Solution

01

Smart Water Meter with LoRa/LoRaWAN Dual-Mode Comm.

02

IR Pad for Meter Recharge & Query, CIU optional

03

MDT for Remote Water Sale & Walk-by AMR

04

LoRaWAN Gateway for Remote Meter Recharge & Automatic Data Collection

05

LAISON Hardware & Data Management System (HDMS）

LoRa/LoRaWAN Dual-Mode Ultrasonic Smart Water Meter

- **Plastic Body, DN15-DN20**
- **Support LoRa and LoRaWAN Dual-mode**

  LoRaWAN Gateway AMI for areas with concentrated households

  LoRa Walk-by AMR as a complementary solutionfor areas with dispersed households
- **Support Standard LoRaWAN Communication Proposal**
- **Automatic daily data upload** for analysis
- **10 years Hourly/Monthly consumption data storage** in meter
- Large battery capacity, 8.5Ah, **6+ years battery lifespan, replaceable**

MID certified

OIML certified

WRAS certified

IP68 certified

LoRaWAN Comm. Parameters of Smart Water Meter

Communication Method

LoRaWAN Comm.

Reserved Infrared Comm.

Communication Distance

LoRaWAN: 5 km Line of View

Infrared: <2m without any obstacle

LoRaWAN Parameters

- Support **LoRaWAN 1.0.4 protocol** specification
  - Support Class A
  - Support OTAA and ABP
  - Support ADR (Adaptive Data Rate) mechanism and fixed-rate communication
- **Frequency Band**: EU868
- Walk-by meter reading via LoRa Comm. as compensation in case LoRaWAN comm. fails
- **Communication bandwidth**: 125kHz
- **Spreading factor/Data rate**: SF7 (DR5) ~ SF12 (DR0)
- **Number of channels**: 8 uplink channels
- **Payload**: 51 bytes
- **Maximum transmission power**: 23dBm
- **Sensitivity**: -137 dBm @ SF12/BW 125kHz

LoRa Alliance

LoRaWAN CERTIFIED CERTIFICATE OF COMPLIANCE
LoRaWAN Certified™ Product

The LoRa Alliance® is pleased to congratulate Hangzhou Laison Technology Co., Ltd. on the completion of the LoRaWAN Certified™ certification program for the following product:

Manufacturer	Hangzhou Laison Technology Co., Ltd.
Type of Device	End Device
Model Identification	PARISE Smart Water Meter
LoRaWAN® Region	EU863-870
Fimware or Software Version	450 (Firmware)
Hardware Version	745
Certification Date	21-December-2022
LoRaWAN® Specification Version	V1.0.2
LoRaWAN® Regional Parameters Version	1.0.2rB
Class of Operation (A, B or C)	A
Optional ADR Feature Supported	Yes

This Certificate serves to confirm that the above-mentioned product has passed all relevant tests in conjunction with the LoRaWAN Certified™ program and is deemed compliant to it. The manufacturer has been granted the right to use the LoRaWAN Certified™ logo.

The usage of the LoRaWAN Certified™ logo is limited to the described device and does not encompass any changes, firmware upgrades or subsequent versions and models after the listed test date. All usage guidelines for the LoRa Alliance® also apply to the above.

Congratulations on your compliance to the program!

Sincerely,

Donna Moore, CEO and Chair

5177 Brandin Court, Fremont, CA 94538, USA • Phone +1 510-492-4044 • Fax +1 510-492-4001
www.lora-alliance.org

LAISON LoRaWAN Smart Water Meter is certified by LoRaAlliance since year 2022

LoRaWAN Gateway

- Model: OG-43
- Quad-core industrial processor with big memory
- Compatible with High amount of traffic, with low power consumption
- 8 half/full-duplex channels
- Ethernet, celluar (4G/3G) and WIFI supported
- Security communication with multiple VPNs like IPsec/OpenVPN/L2TP/PPTP/DMVPN
- PoE or Solar Panel Power supply optional
- Alarm trigger when Power off
- Protection Level: IP67

Technical parameters for LoRaWAN gateway

Basic specification

Ingress Protection： IP67
Dimensions: 250 x 172 x 92 mm (9.84 x 6.77 x 3.62 in)
Power Input: 1 × 802.3 af PoE input or 12 VDC with M12 Connector
Power Consumption: Typical 3.6 W, Max 4.8 W
Operating Temperature: -40 ℃ to +70 ℃， Reduced Cellular Performance Above 60 ℃
Storage Temperature: -40 ℃ to +85 ℃
Relative Humidity: 0% to 95% (non-condensing) at 25 ℃
Installation: Wall or Pole Mounting

LoRaWAN

Antenna: 2 × Internal Antennas + 2 × 50Ω N-Female External Connectors
Channel: 8 (Half/Full-duplex)
Frequency Band : CN470/IN865/EU868/RU864/US915/AU915 /KR920/AS923/AS923-2
Sensitivity: -140dBm Sensitivity @292bps
Output Power: 27dBm Max
Protocol: V1.0 Class A/Class B/Class C and V1.0.2 Class A/Class B/Class C

Software Function

Network Protocols: PPPoE, SNMP v1/v2c/v3, TCP, UDP, DHCP, DDNS, HTTP, HTTPS, DNS, ARP, SNTP, Telnet, SSH, MQTT, etc
VPN Tunnel: OpenVPN/IPsec/PPTP/L2TP/GRE/DMVPN
Firewall: ACL/DMZ/Port Mapping/MAC Binding/URL Filter
Management: Web, CLI, SMS, On-demand dial up, DeviceHub, IoT Cloud
Reliability: WAN Failover
App: Python SDK, Node-RED

Interface

Wi-Fi Interface: IEEE 802.11 b/g/n, 2.4GHz
Cellular Network: Cellular Network
GPS
Ethernet

2.1.1. Flexible Water Purchase Way

Option 1
Vending Points
Purchase by Cash

Laison Vending System&Printer

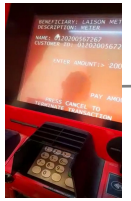
Option 2
Vendor
Purchase by Cash

Mobile Vending POS

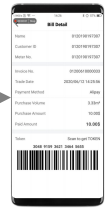
20 Digits Recharge Token

Option 3
Customer self-service
Purchase via E-payment

Smart Phone & Classic Phone



ATM



20 Digits Recharge Token

IR Pad

Meter Recharge

Data Query

≤2m

Smart Meter

Split keypad for Meter Recharge

IR Pad

- **Material:** ABS for Casing, 0.125mm PET for Nameplate
- **Dimension:** 115*50*18.5mm
- **Comm. Method:** Infrared Comm. integrated
- **Comm. Distance**: ≤2m
- **Silica Gel Keypad**
- **Power Supply:** Dry battery(2pcs AAA), replaceable, Typical Lifespan is no less than 2 year
- **IP Level**: IP54

LoRa CIU (optional)

- **Material:** ABS for Main Case and PET for Nameplate
- **Dimension:** 80* 140 * 30 mm
- **Weight:** 200g
- **Comm. Method:** LoRa Comm. integrated
- **Comm. Distance:** 200m
- **Touchable Keypad**
- **Power Supply:** Dry Battery, replaceable (4pcs AAA)
- **IP Level**: IP54

2.1.2. AMI/AMR FOR REMOTE DATA COLLECTION

Fixed DCU AMI

LoRa

LoRaWAN Gateway

≤ 5 km (Line of View)

LAN/GPRS/3G/4G

MDMS

HDMS Service Center

LoRa

Walk-by AMR

MDT (Mobile Data Terminal)

MDC (Mobile Data Collector)

3G/4G/WIFI

≤600~1000m in Radius

2.1.3. Advantages of AMR/AMI

LoRaWAN Gateway AMI

Areas with Concentrated household

- Private Network, flexible deployment, technically **100% signal coverage**
- **PoE/Solar Panel power** supply optional, easy for construction
- Robust Casing of Gateway, support **outdoor installation**

- **Coverage: ≤5km** Residential
- **Installation Height Recommended: ≥20m**

Common Functions

- **Remote Meter Data Collection** (Hourly Consumption Data Record, Meter Running Status etc.)

- **Remote Meter Valve Control**
- **Tamper Event Detection & Alarm** (Water Leakage/Meter Dismantle, etc.)

Walk-by/Drive-by AMR

Areas with Dispersed household

- **Comprehensive solution** with Mobile Data Collector (MDC) and MDT (Mobile Data Terminal) with LAISON self-design AquaRadius APP. for meter data collection
- **GIS Info. Collection** and Intuitively display of each meter's GIS info.
- **Automatic walking/driving route design** on AquaRadius, user-friendly
- **Manual Meter Reading support** for fault meters which fails to communicate via LoRa

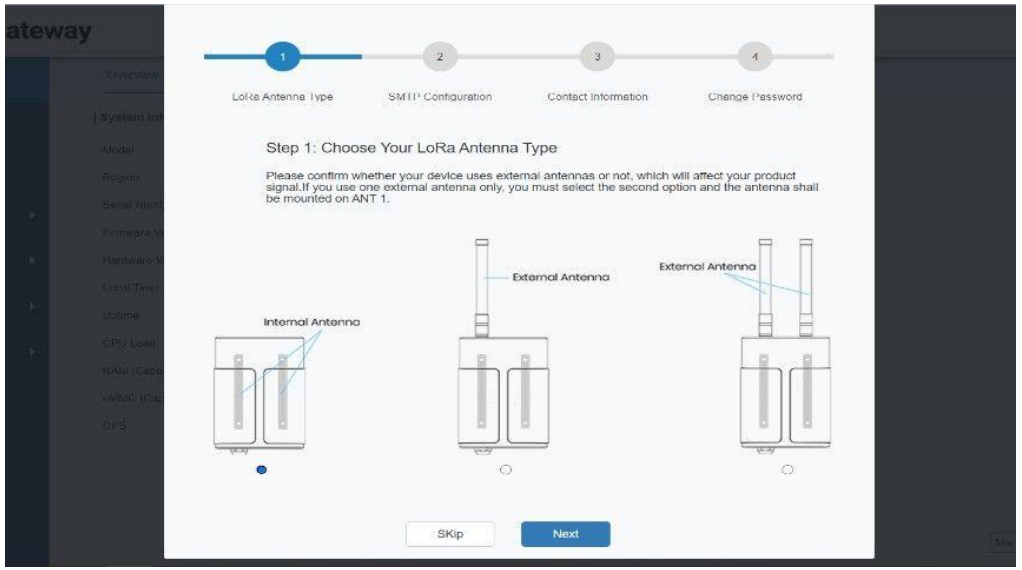
Installation of LoRaWAN Gateway

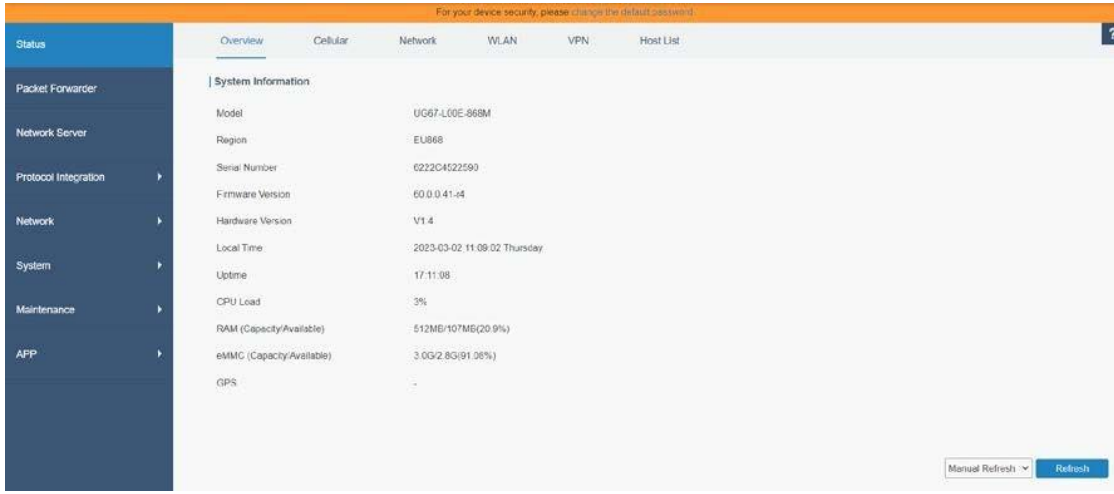
1. Hardware Install (SIM Card, Antenna, Network cable & Power cable, Power supply, Gateway install)

2. Gateway Configuration

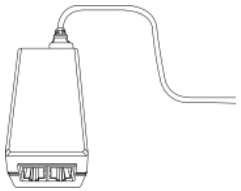
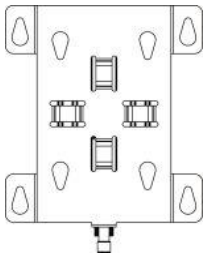
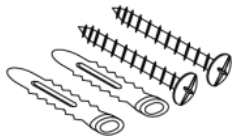
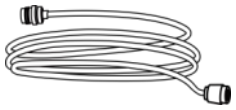
3. Network Connection (Ethernet, WIFI, Cellular optional) **Configuration**

4. NS Server Connection (LAISON or 3rd party IoT Platform)



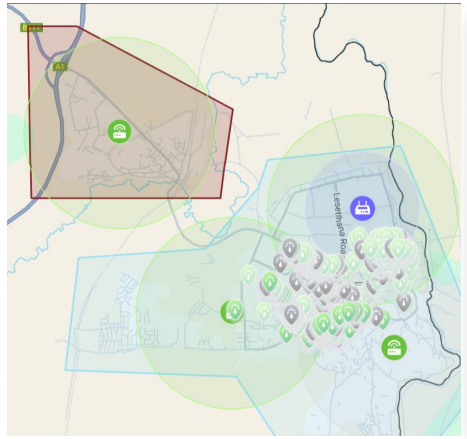


Packing List of LoRaWAN Gateway Installation

				
1 × OG43	1 × PoE power supply	1 × mounting plate	Wall mounting screw kit	1 × RJ45 Port sleeve
				
1 × SIM Plug	2 × Post with hoop	1 × M12-DC Power line	1 × LoRa Antenna (1m)	1 × Loop brake

AMI and Online Monitoring Attempt In WUC-BOTSWANA

10,500pcs installed in year 2025
Ultrasonic STS Prepaid Water Meter with **Gateway AMI function**



Implement Result

***Gateway Quantity**: 6 units installed, installation ongoing*
Comm. distance defined**: **2.5 km in radius
***Coverage**:3505 meters*
***One time comm. successful Rate**: 96.43%*

LoRa®
LoRaWAN™

Solar Panel Solution

Solar Panel System (Battey capacity 100AH) could support the normal working of Gateway for 10 days without any sunshine

**Power consumption of Gateway: 4.8W*
Theoretical working days without any sunshine:
Battery capacity 100AH:
*100AHx12V/4.8W/24=**10.4 Days***
Battery capacity 160AH:
*160AHx12V/4.8W/24=**16.7 Days***

2.2 PARISE IoT (Internet of Things) Online STS Prepaid Smart Water Meter solution

01

IoT Smart Water Meter with GPRS/NB-IoT/LoRaWAN etc. Comm.

02

LAISON Hardware & Digital Billing Management System (HDMS)

03

Smart Phone APP Customer Self-service Water Purchase, E-payment, Data Query etc.

Working Process & System Structure

Integrated Application

- CRM
- Billing System
- Mobile Payment Platform
- ERP

Restful API

Application Layer

- **LAPIS** Revenue System
- **AquaTEC** Leakage Management System
- **AquaWork** Work Order System
- **La-Vice** Value-added Service
- **Customer APP**

Restful API

Service Layer

- MDMS

Kafka/MQ/Restful API

Network Layer

- IoT Platform
- MQTT
- LoRaWAN NS

HDMS

Communication Layer

- Cat.1
- GPRS
- NB-IoT
- sigfox
- Gateway

LoRaWAN

Smart Device

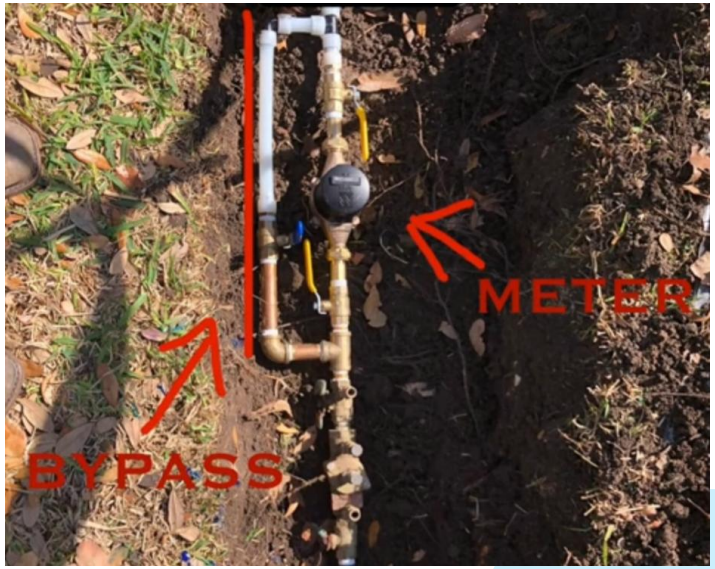
2.2.2. Prevent Illegal Water Usage to reduce NRW

Instant Alarm Notification via HDMS system, Email or SMS

01

Meter Dismantle Detection & Alarm

Three-axis sensor integrated to electronic module **detects meter position changes**, enabling immediate identification of tampering or dismantling attempts and triggering an alarm



02

By-pass Detection & Alarm

Leverage **hourly consumption data** and **cloud-based data analytics** to detect anomalies like **zero-usage patterns**, enabling proactive bypass activity identification

03

Water Leakage Detection & Alarm

Monitor the minimum nighttime flow and its' trends at specific points to determine whether there are new leaks in the area

Smart Water Meter In LUSAKA, ZAMBIA

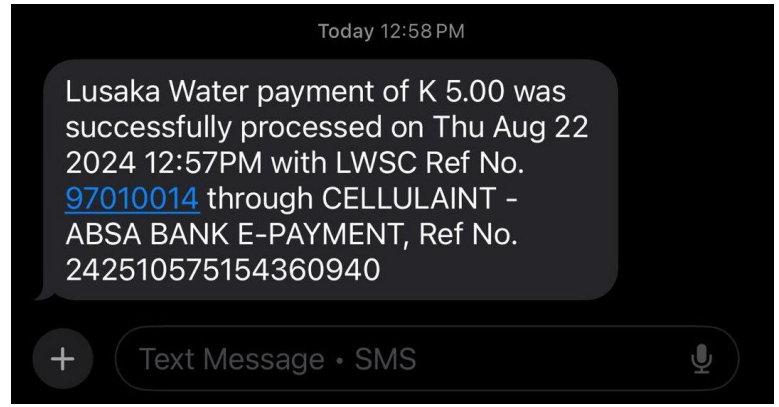
GPRS STS Prepaid Smart Meter Solution

- Meter Online (GPRS)
- Automatic Remote Meter Recharge
- STS standard IEC 62055-41,51 comply
- Self-service Water Purchase by E-payment
- Automatic Meter Data Collection

Data Bundle cost for SIM Card

MTN network, 10M per meter per year, based on daily reporting, costing 2～3 USD

One time comm. successful Rate: 95%



Water Purchase via USSD

NB-IoT LoRaWAN CERTIFIED GPRS

2.3 Bulk STS Prepaid Smart Water Meter

Pilot Valve

- DN32-DN150
- Magnetic drive, lower transmission resistance
- Super dry with Copper can Register(IP68)
- Pilot Valve integrated for Water Cut-off, Prepaid Working Mode available
- Woltman Meter, Pilot Valve and Electronic Module separation structure, easy for maintenance
- Split CIU with Touchable Keypad for Meter Recharge & Data Query
- AMR/AMI reserved for Remote Meter Data Collection

Pilot Valve(DN32-DN150)

- *Low Voltage to drive, Working Voltage of Motor: 3V-6V*
- *Utilize the Water Pressure Difference to open/close valve*
- *Working Pressure: 0.3MPa-1.6MPa*
- *Max. open/close times: no less than 8000 times*

2.4 Bulk Postpaid Smart Water Meter

Woltman Type Water Meter, range from DN32-600

Meter+MIU Separation structure, easy for deployment & maintenance

IoT Ready for Remote Monitoring and Data Collection

Electronic Module fully Sealed. IP68

Automatic Meter Data Upload

Real-time Remote Communication with Meter

2.5. Meter Installation & Accessories

2.6.1. Plastic Meter Box

Key

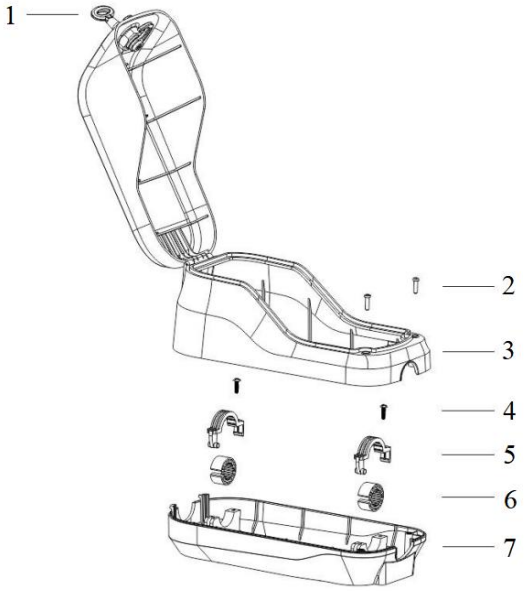
Waterproof Groove

Material: Polypropylene

Meter Box Bottom

Dimension: 306 * 146* 169mm

一、Exploded view



1. Key
2. M4*10 Machine Screw
3. The Meter Box Body and Cover
4. M4*14 Tapping screw
5. Buckle
6. Gasket
7. The Meter Box Bottom

二、Component List

Plastic Water Meter Box Component List		
Diagram	**Name**	**Quantity**
	The Meter Box Bottom	1
	The Meter Box Body	1
	The Meter Box Body and Cover	1
	Buckle Seat	2
	Buckle	2
	Gasket	2
	Key	1
	M4*14 Tapping screw	2
	M4*10 Machine Screw	2
Tool List (Prepared in local)		
	Phillips Screwdriver	1

Note: If the product received does not match the illustration, please refer to the actual product

2.6.2. Required Accessories

	 			
LoRaWAN Smart Water Meter (Plastic Body)	Connection Fittings (provided together with meter)	Non-return Valve (provided together with meter)	Lock Ball valve + Strainer	or Stop Valve
				
Quick Union	Connector	PVC Pipeline	PTFE Tape	Plastic Meter Box (Optional)

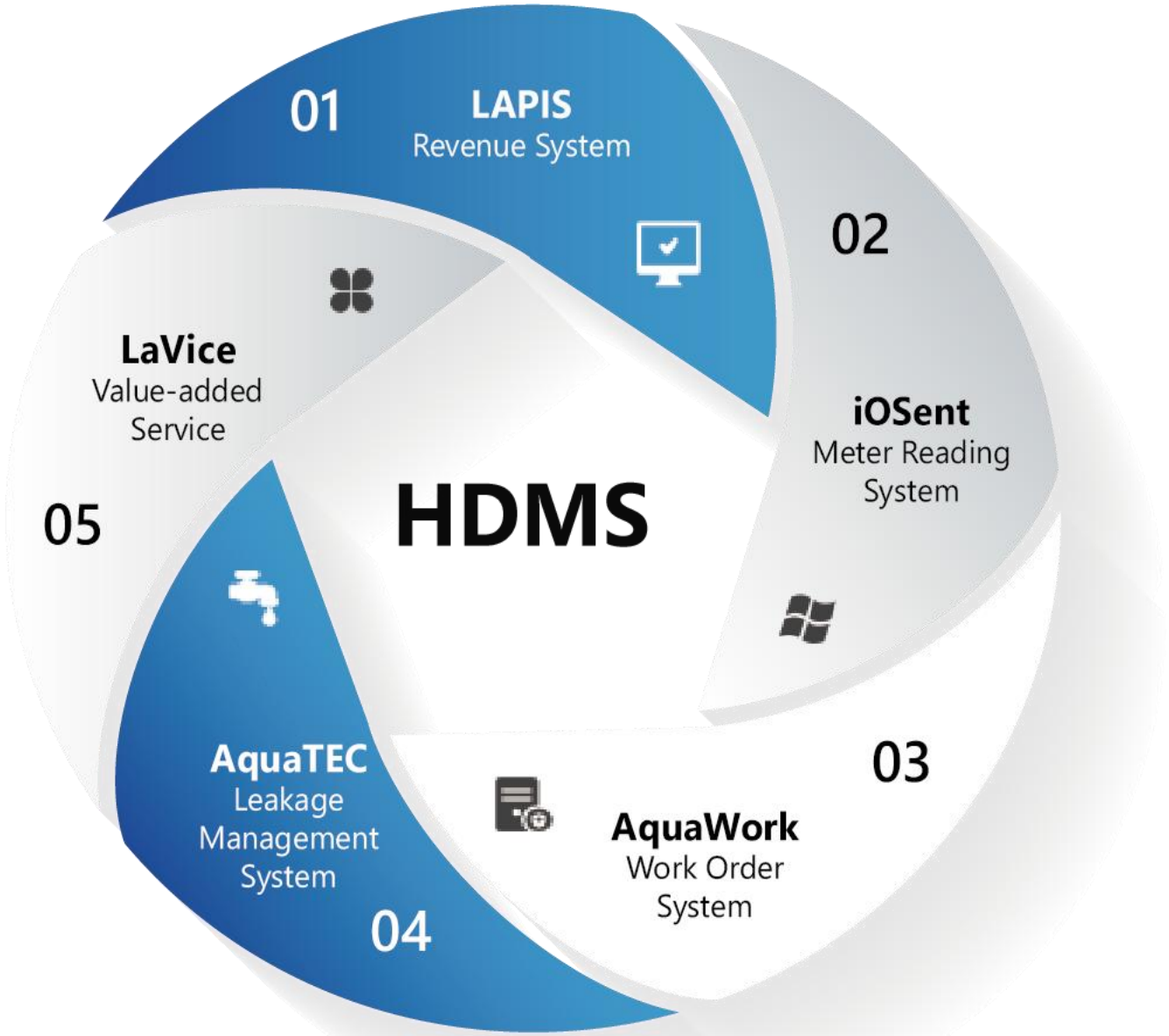
03

Creating Values through Continuous Innovations

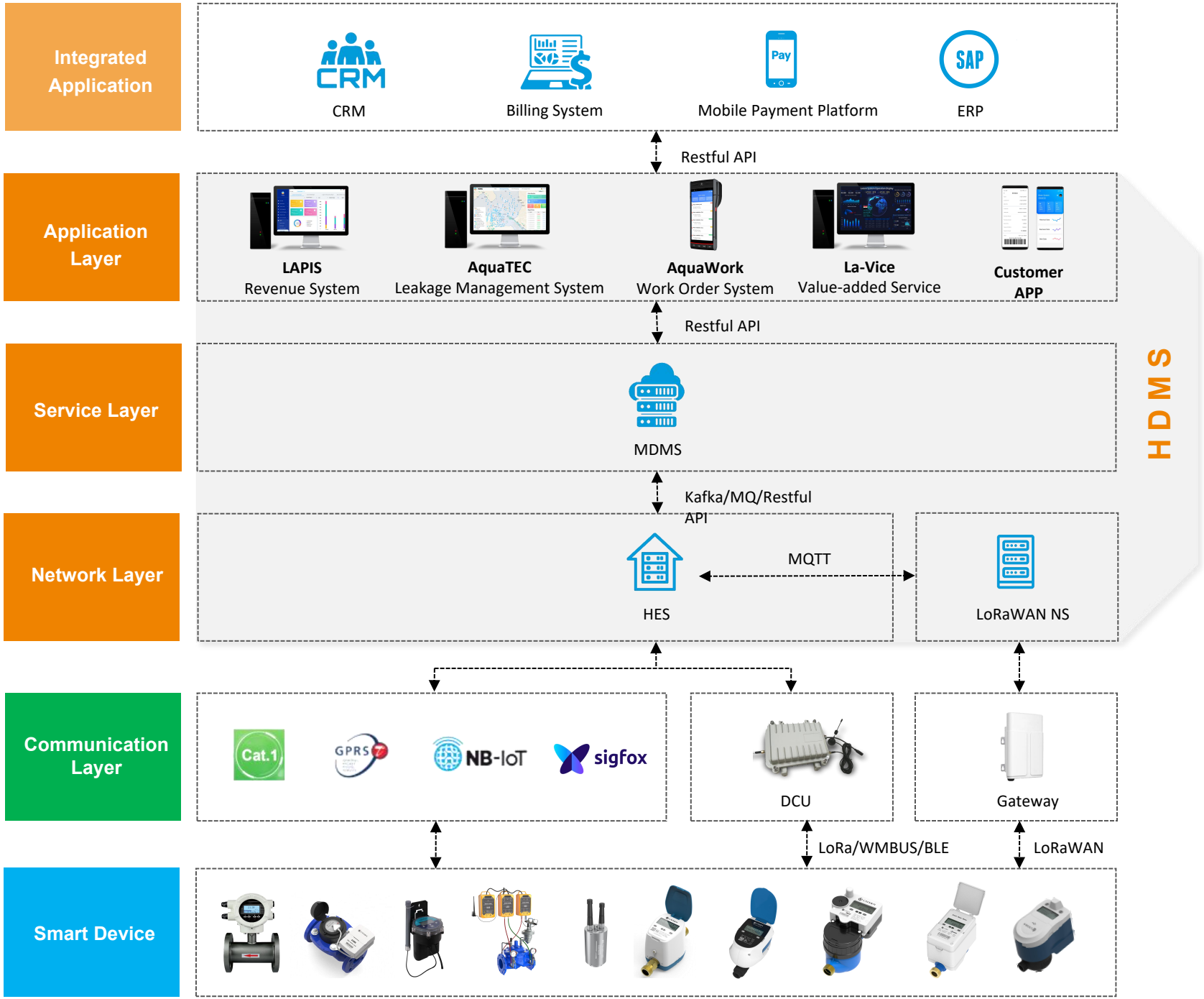
PART THREE

Hardware & Data Management System (HDMS)

Hardware & Data Management System (HDMS)



System Structure of IoT platform & HDMS system



3.1. Revenue System LAPIS

Comprehensive Revenue Management

Integrate meter, client, billing, and reporting functions for unified business operations

Prepaid & Postpaid Revenue Collection Optional

Compatible with various meter types (Mechanical, Prepaid, Smart, etc.)

Flexible Additional Fees & Historical Debt Collection

Supports various ways like pay by percentage, times, days, months, etc.

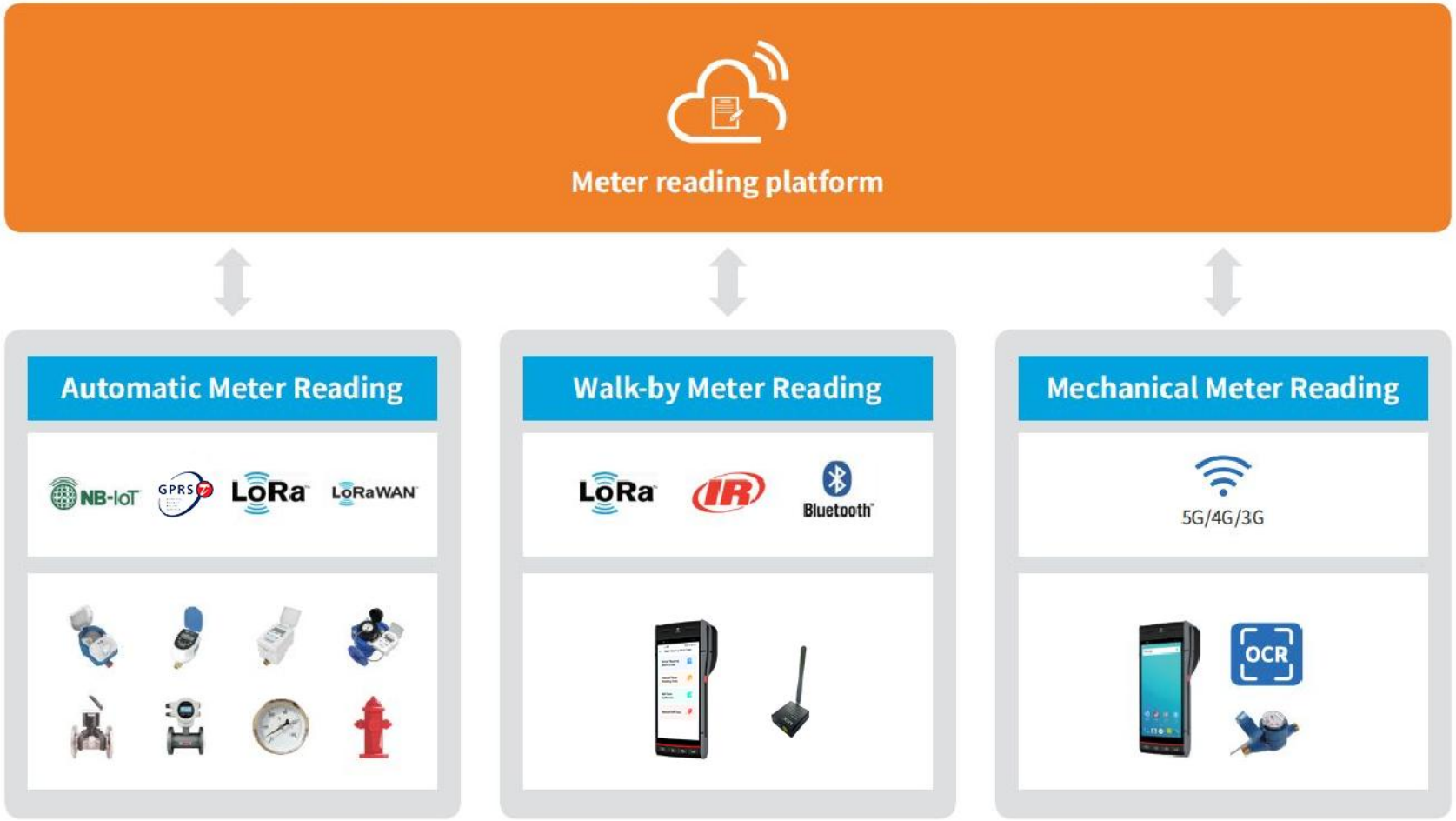
Diverse Water Purchase/Payment Channels

Traditional Vending Station, Appointed Vendor by PoS, Local ATM, Mobile Money via USSD, Self-service APP, etc.

API & ERP Integration

Standard/customized APIs for seamless e-payment integration and ERP/ Billing system compatibility.

3.2. Meter Reading System iOSent



Efficient Digital Meter Reading

Automatic or semi-automatic with no manual errors or corruption.

Customer Self-Service

Real-time access to water usage and balance, improving satisfaction.

Remote Data Monitoring & Analyzing

Identify abnormal water consumption like abnormal High/Low Consumption, Continuous Consumption, etc.

Abnormal Event Alerts

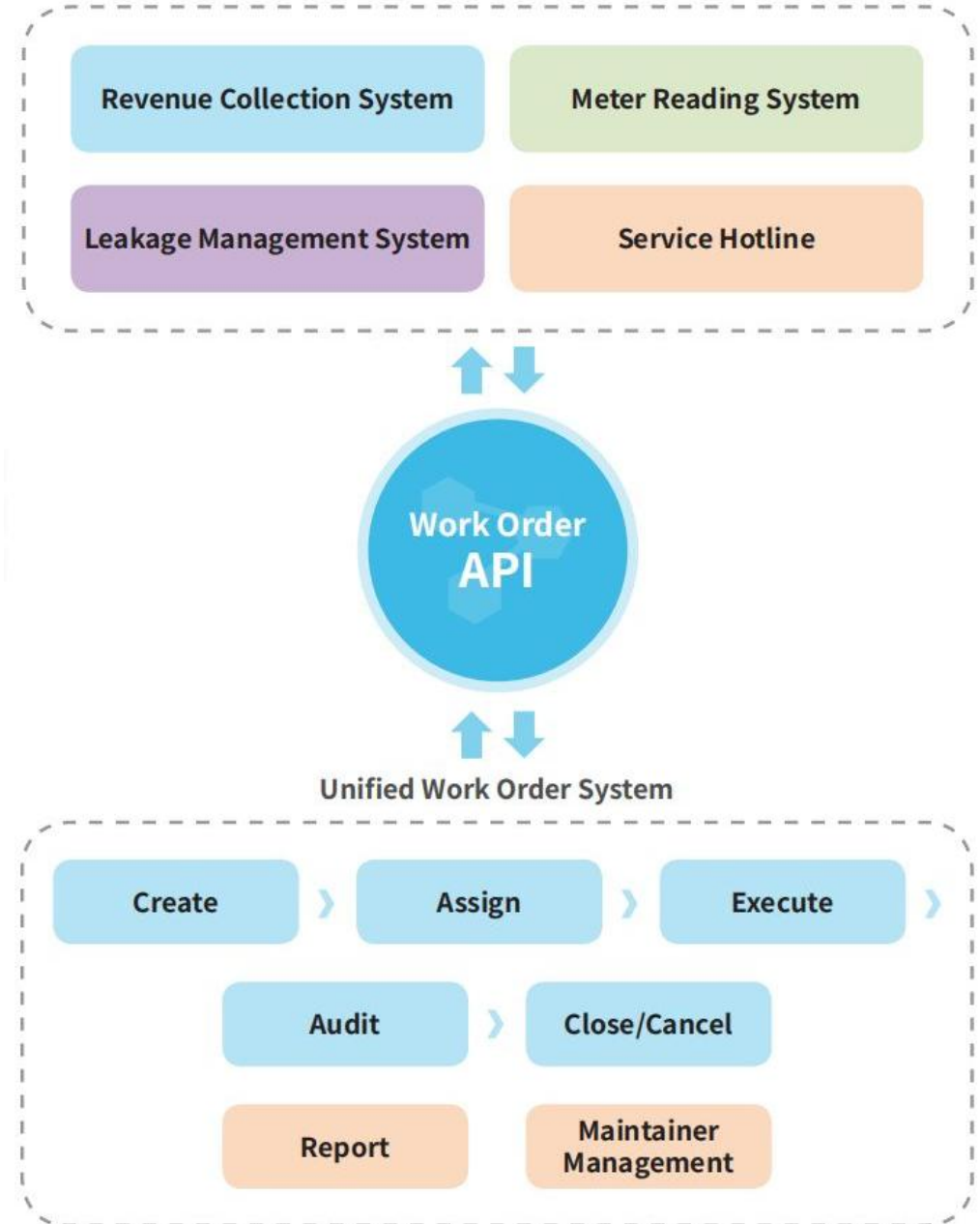
In-time alarms for issues like low battery or leaks, quick action on maintenance.

3.3. Work Order system AquaWork

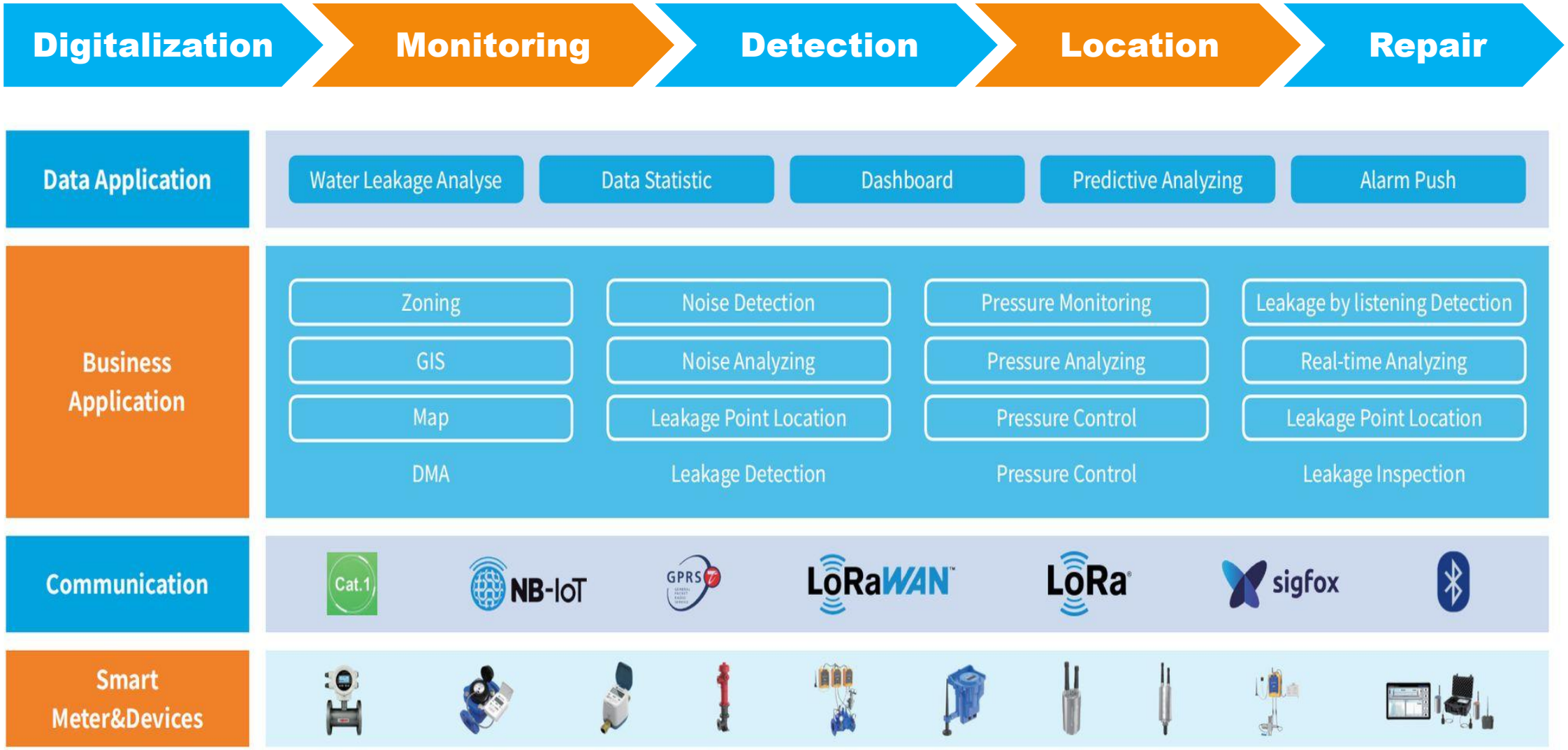
Multiple Source to receive Work Request

Standard Work Order API

Basic Work Request Handling process



3.4. Leakage Management System AquaTEC



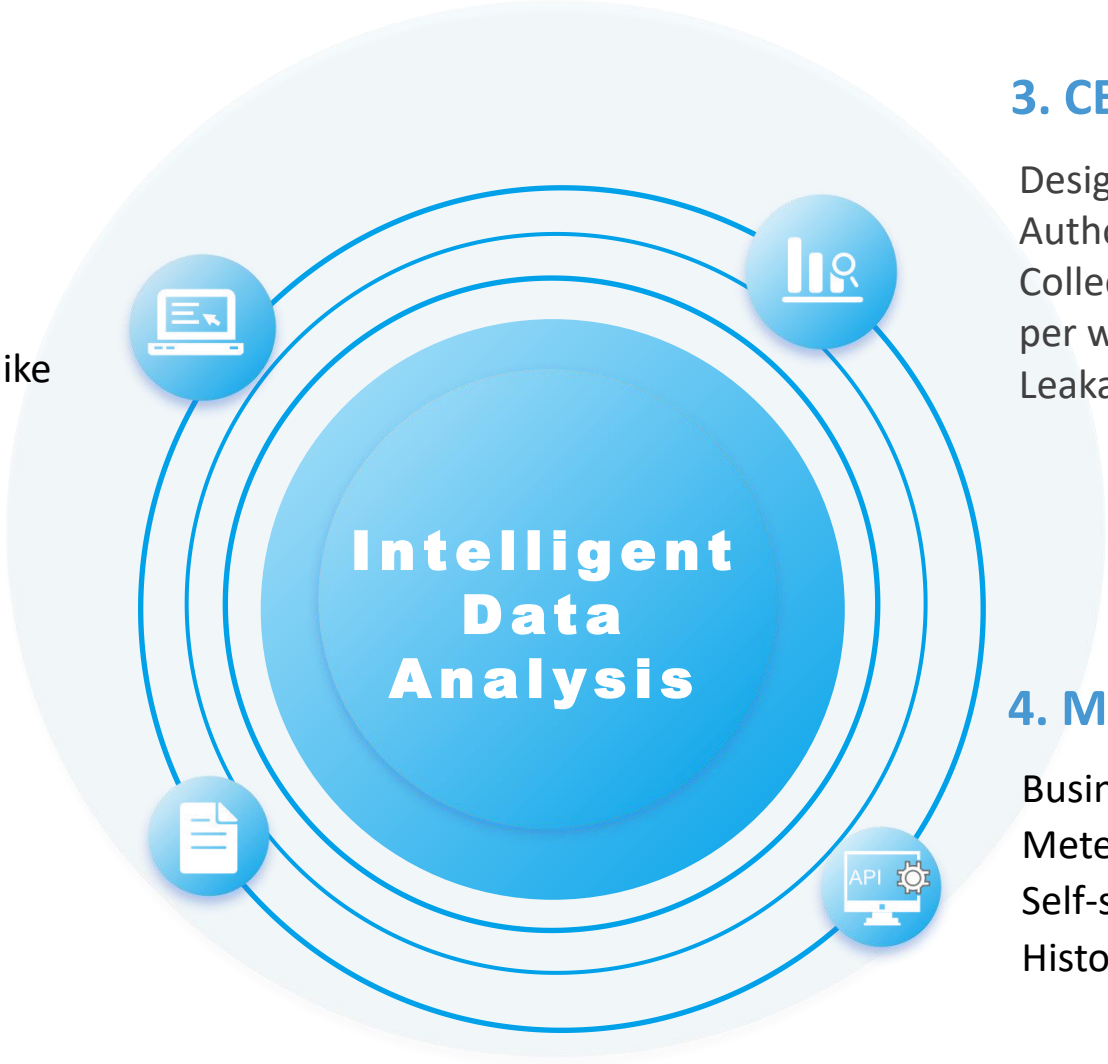
3.5. Value-added system LaVice

1. Dashboard

Real-Time Monitoring on Operation Status (Revenue, Consumption etc.)
Instant Alarm on abnormal sceniro like Meter Fault, Water Leakage etc.

2. Data Statistic Report

Various Data Stastistic Report on collected meter data for further anaylizing and decision making



3. CEO Cabinet

Designed for Management Level of Water Authority, including Water Revenue Collection, Water Consumption statistic per week/month/quarter and Water Leakage Report if any

4. Mobile APPs

Business Online (Customer Registration, Meter under maintenance etc.)
Self-service Water Purchase via E-payment
Historical Water Purchase Records Query

04

Creating Values through Continuous Innovations

PART FOUR

Typical Cases

Typical Projects Under going

Project	Business Mode	Quantity/units
Egypt Project	PCBA+Local Assembly	500,000
CoH Project, Zimbabwe	Service Level Agreement (SLA) for Supply Contract	320,000




Case Study – HCWW Smart meter Egypt

HOLDING COMPANY FOR WATER AND WASTEWATER

Projects to be executed in 2025:

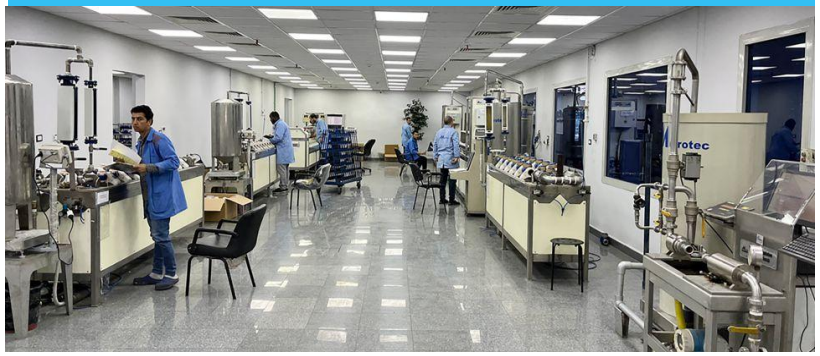
1 million: HCWW(National Water Department, responsible for the water supply of Egypt’ s old city)

200,000: NUCA(National Water Department, responsible for the water supply of Egypt’ s new city)

Order amount of Laison in 2025:
200,000 HCWW + 50,000 NUCA

Product Solution:
Customized prepaid smart card meter solution, Specified water meter management system (unified protocol), Integration with local mobile payment)

Local Factory:
1 million production capacity (including casting +assembly, mechanical meter + smart meter)

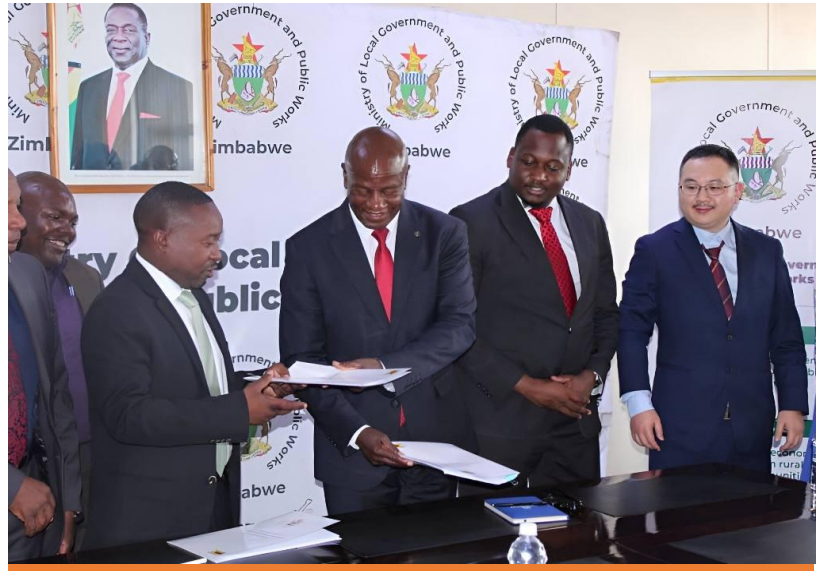


Partner in Egypt

Metrotec EGYPT
المصرية الألمانية لصناعة عداد المياه

Case Study - Harare, Zimbabwe

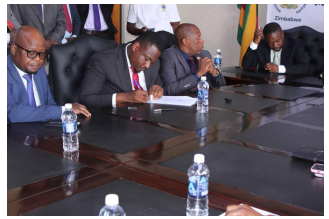
Project: A comprehensive water privatization project integrating **purification, distribution, smart metering, and billing** with **650,000 smart meters (** 320,000 Harare + surrounding cities) deployed to optimize water resource management and efficiency.



Project Funding: Government funding, African Development Bank

Project Status: **Memorandum of Agreement for a public-private partnership (PPP) arrangement meant** already sined between Ministry of Local Government and Public Works, Harare City Council and LAISON through its local partner-Helcraw Electrical;

Water Plant Project Contract signed (Four 250,000-ton water plants)



Product Solutions: LoRa Split STS Prepaid Smart Water Meter, with AMR/AMI for remote meter data collection

WATER UTILITIES IN COOPERATION

WATER UTILITIES IN COOPERATION

IMO STATE WATER AND SEWERAGE CORPORATION
ISWSC

EKITI STATE WATER CORPORATION
WATER IS LIFE

OGUN STATE WATER CORPORATION
SUSTAINABILITY CUSTOMER SATISFACTION OUR GOODS
OG. S. W. C.

EMPRESA DE ÁGUA E SANEAMENTO DO HUAMBO - EMPRESA PÚBLICA
E.A.S.H-EP

TABORA WATER SUPPLY AND SANITATION AUTHORITY
MAMLAKA YA MAJISAFI NA USAFI WA MAZINGIRA TABORA
TUWASA

Municipality of
Gobabis
EX ORIENTE LUX

BLANTYRE WATER BOARD
MALAWI

NORTHERN REGION WATER BOARD
MALAWI

CENTRAL REGION WATER BOARD
MALAWI

MAMLAKA YA MAJISAFI NA USAFI WA MAZINGIRA MJINI DODOMA
DUWASA

ZINWA
For Communities. For Development

AdRM

SUEZ CANAL
AUTHORITY

LUSAKA WATER SUPPLY AND SANITATION
Water is Life... Value it!
Sanitation is Health
COMPANY LIMITED

LUKANGA
WATER SUPPLY AND SANITATION COMPANY LIMITED

NKANA WATER AND SEWERAGE
COMPANY

Safe
WATER NETWORK

Phwater
PORT-HARCOURT WATER CORPORATION

KADSWAC
KADUNA STATE WATER CORPORATION

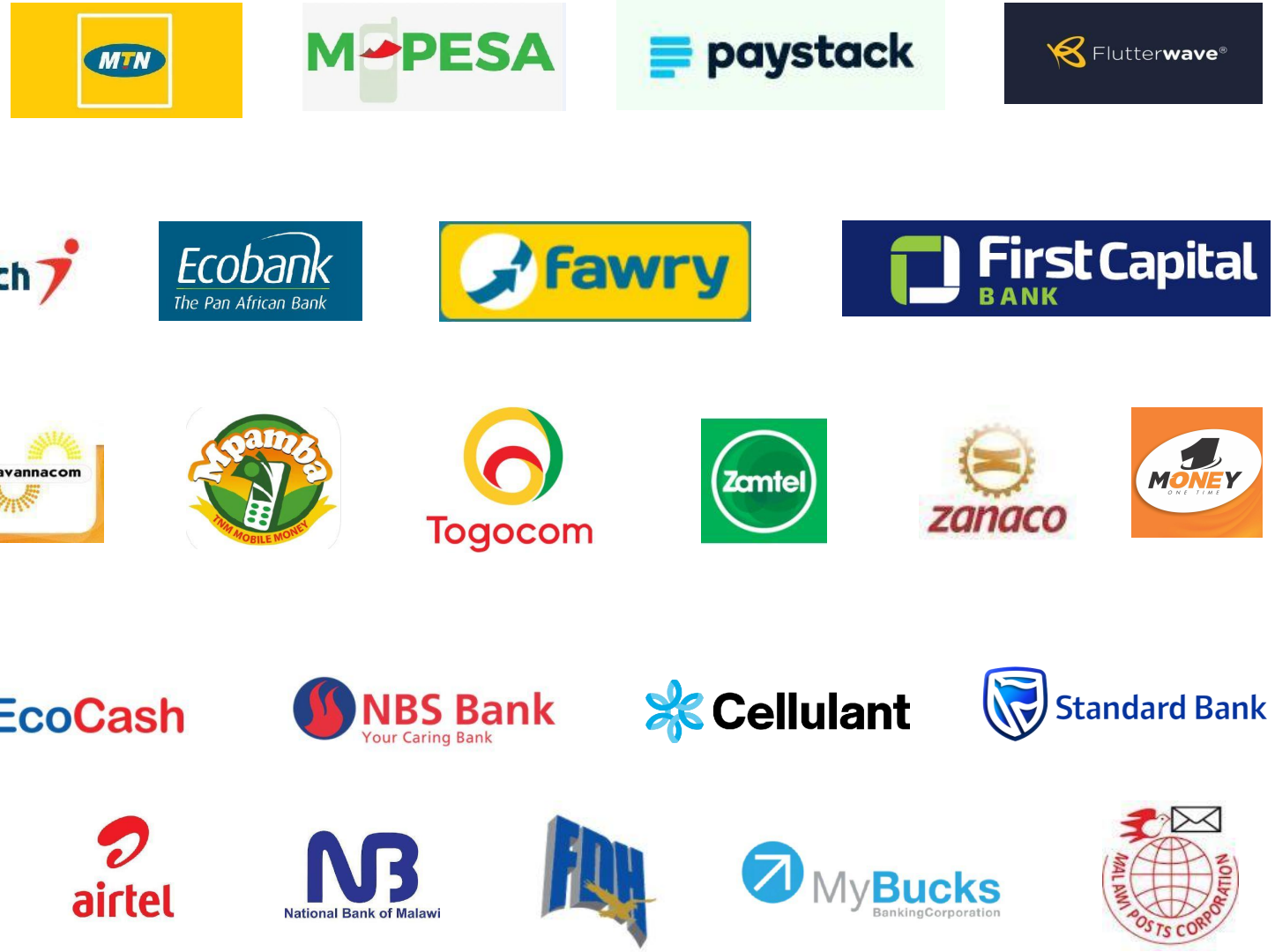
L'AISON

30+

Mobile Payment Platforms Integrated

12+

Countries



Strategy Product Leading, Scale-Driven , Global Operation

Mission Creating Values by continuous innovation

Vision To be global IoT product and data service provider

Core Valus Innovation, Collaboration, Focus, Agility

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