NAWASSCO ERP System

An Integrated Water and Sanitation Data Tool

The Enterprise Resource Planning (ERP) system used by Nakuru Water and Sanitation Services Company (NAWASSCO) is an integrated utility management system designed to provide comprehensive water and sanitation services in Nakuru, Kenya.

NAWASSCO launched the ERP System in 2019 to oversee finance, human resources, procurement, inventory management, billing, technical operations and project management in Nakuru's water and sanitation sector.

Figure 1: NAWASSCO ERP landing page.

Pick pay - a payment service provider, provides the hosting service with customization of the data system and system integration developed on Microsoft Dynamics and ArcGIS system.

Pick pay provides a centralized landing page for NAWASSCO staff to navigate the entire system modules, which include billing, technical, customer relationship management (CRM), the GIS module, the Maji application, and the self-service portal. Admin and system management is a support function across all the modules. **Details about the different modules are presented below:**

1. Billing Module

NAWASCCO manages its monthly billing and payments on the ERP system's billing module. The platform has various sub-modules and functionalities for billing management. The sub-modules include revenue enhancement, billing, accounts opening and enquiry, payment for services, non-revenue water & meter management, and reports. Other support tools on the billing module include a business tool and a help manual.

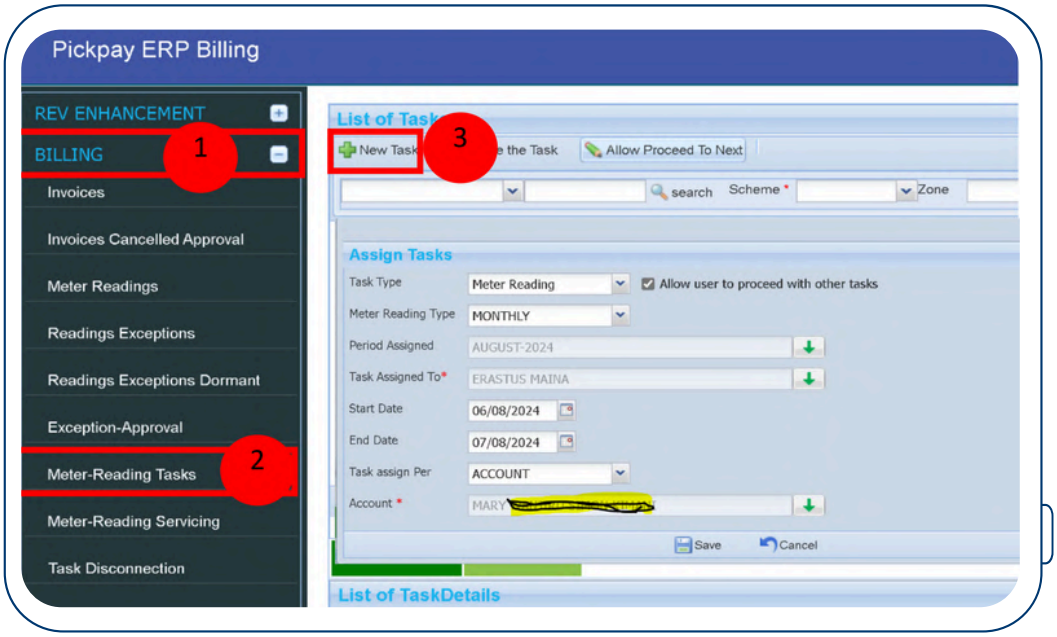

Figure 2: Assignment of a task in the system

In the billing module, tasks can be assigned. Once the task is assigned in the module, field officers (Marketing Assistants/Plumbers/Foremen) can download the work assigned on their mobile phones and proceed as shown below:

Figure 3: Resolution of an assigned task.

2. Maji Application

Maji application is a customer-facing app that offers customers a seamless customer service experience for water and sanitation services in Nakuru. These include among others, self water meter reading, exhauster registration, and application for water & sewer connections, buying water tokens, staff identification and checking balances. The mobile app, known as the NAWASSCO app, can be downloaded on the Google Play Store. Customers on the Maji app include individuals in need of water and sanitation services for residential, commercial, industrial purposes and exhaust truck operators who use the NAWASSCO waste treatment plant for disposal.

The process for providing water and sanitation services through the Maji application is outlined below:

- A one-time registration where customers are on boarded onto the Maji application. They can then generate queries for different services.
- For instance, a customer can use the Maji app to request for a water connection or request to dump waste at the waste disposal and treatment plant. NAWASSCO is notified of the service request on the ERP system. This prompts NAWASSCO to generate an invoice for the customer, which is then shared via the Maji app.
- The customer receives the invoice for payment. Once the customer makes the payment, NAWASSCO facilitates the service provision. Customer information from the Maji application is stored and analysed on the ERP system.
- The customer is notified when a service is completed. If a water connection is set up, the customer's water billing system is set up on the app. Additionally, the Maji app allows the customer to query any billing and resolve complaints.

Figure 4: Integration of Maji App into NAWASSCO operations.

3. CRM Module

The CRM module enables NAWASSCO to manage and track customer complaints and requests for water and sanitation services made from the Maji application. It provides NAWASSCO oversight of on-site sanitation (OSS) and faecal sludge management (FSM) service delivery.

4. Technical Module

The technical module on the ERP System is used by NAWASSCO to monitor technical services from abstraction of water up to disposal of waste water. Sub modules in the technical platform include system for managing the laboratory services, energy audits, production, electromechanical, network management, wastewater operations, and system management.

For instance payment for registration of private exhausters for discharge permits is being done through the ERP system;

NAWASSCO oversees both OSS and FSM services through the following process:

I. Manual pit emptiers

NAWASSCO works with manual pit emptiers where a customer requests a service on the Maji app or through the customer service desks.

The emptiers visit the customer's location to assess the request and determine the service cost using a form provided by NAWASSCO. The customer care officer at NAWASSCO receives the form with the estimated service cost and generates an invoice from the ERP billing system. NAWASSCO staff can retrieve the invoice from the ERP system. The invoice is sent to the customer through an SMS after which they make payments using different payment options. The manual pit emptiers can access NAWASSCO's haulage truck and other equipment to carry out the emptying service. After completing the service, NAWASSCO pays the manual emptiers.

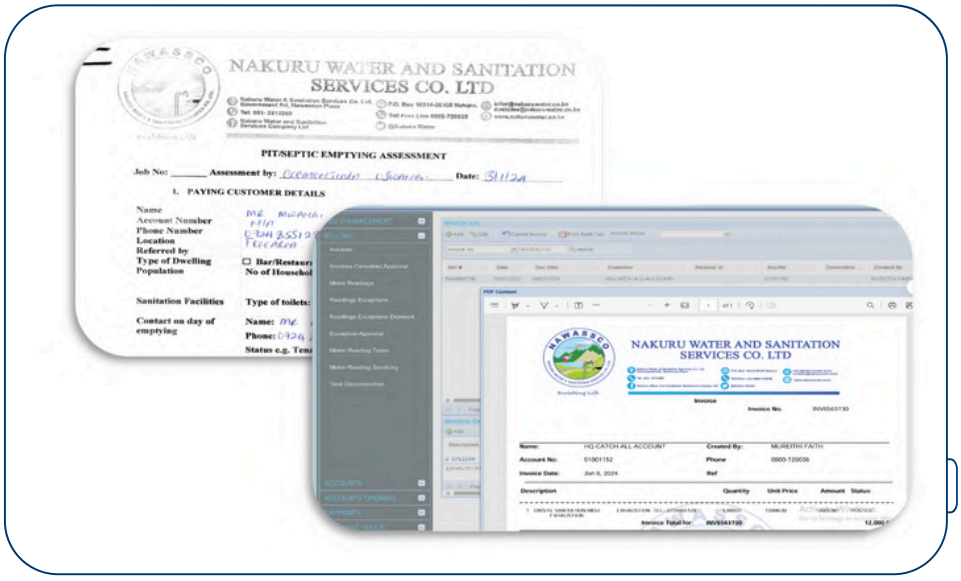

Figure 5: Physical assessment of pit emptying and system based invoicing.

II. Exhaust truck operators

Exhaust truck operators are another category of service providers managed by NAWASSCO. These operators are licensed and registered in the ERP system.

They pay a monthly fee for dumping at the waste water disposal and treatment plants. Invoices for the exhausted truck operators are created using the billing module in the ERP system.

The waste water disposal and treatment plant operator have a custom-built application called the Smart Operations application linked to the ERP system.

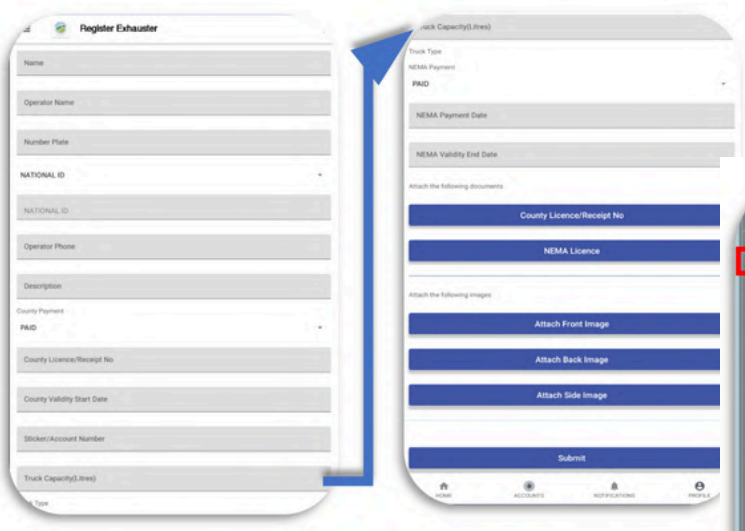

Figure 6 Exhauster registration in the Maji App

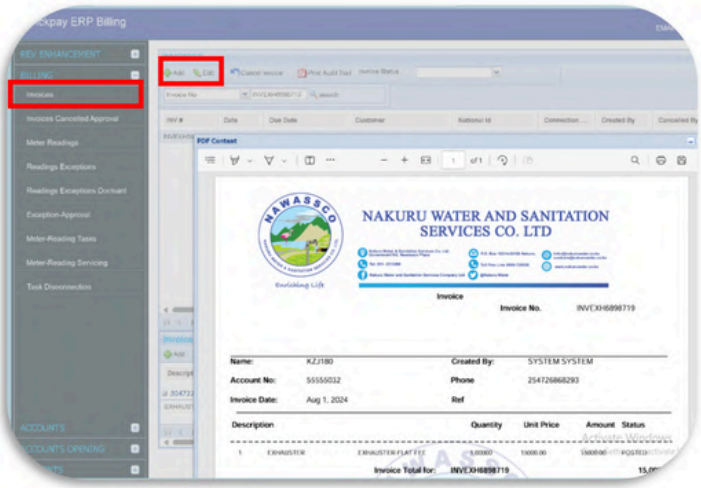

Figure 7: Invoicing of Monthly disposal fee for the exhausters

Figure 8: Smart Operations technical App monitoring exhauster truck operations.

The Smart Operation app is a data collection tool that enables the plant operator to validate the payment information (dumping fee) from the system and the actual disposal to be done.

The plant operator checks to see if the payment has been made and ensures compliance. He then feeds details such as source and volume of sludge to the app.

This data is then stored in the ERP and the utility can track activity of each exhausted track on a daily and monthly basis within the system. NAWASSCO reviews the generated reports on the amount of waste disposed of and treated at the disposal and treatment plants.

5. GIS Module

The GIS module is hosted on an ArcGIS platform, allowing NAWASSCO to visualize data collected in the field. The ArcGIS organises field data into maps and dashboards that include information on current OSS services (such as truck discharge, trips by exhausters, containment, and capture facilities) and other service data. Currently, ArcGIS visualizes 48,500 sewered and non-sewered connections, along with other supporting and infrastructure data.

Data collection for the GIS module

NAWASSCO has been mapping sanitation infrastructure for both sewered and non-sewered on the ArcGIS system using different mobile field applications some hosted within the ArcGIS system while others are open-source stand-alone.

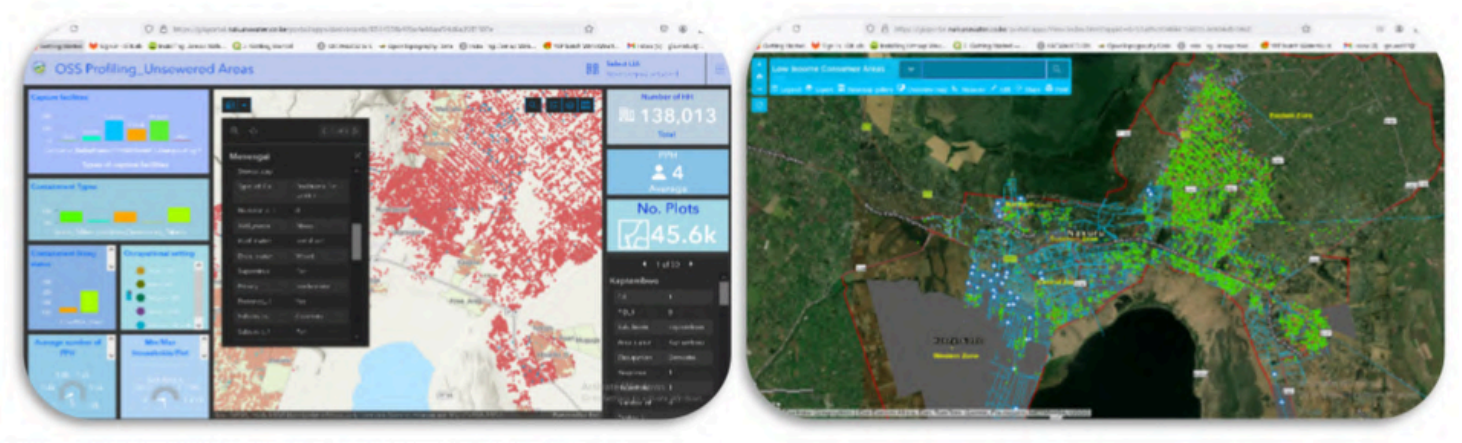

Figure 9: Visualization of mapped infrastructure on the GIS

Some features on the OSS service dashboard include water treatment plants, mapped toilet (public toilet) locations, manholes, and sewer works.

- **For Example:** mWater is a data collection tool currently being used by NAWASSCO to collect OSS and FSM data on the field. It is a standalone, open-source application meaning the data collected is not linked directly to the ArcGIS dashboard or the ERP system. Data collected through mWater is processed and uploaded into the ArcGIS system.

Figure 10: OSS data collection and analysis workflow.

- This manual data input into the GIS module is one of the current limitations that Nakuru hopes to resolve by expanding its current ArcGIS license to enable field officers to collect data directly on the integrated ArcGIS platform with the ERP system.
- NAWASSCO is purposing to upgrade its ArcGIS license and build a schema with triggers on the existing Pick Pay database to accommodate OSS to ensure a seamless and more integrative data collection and analysis into the ERP system.

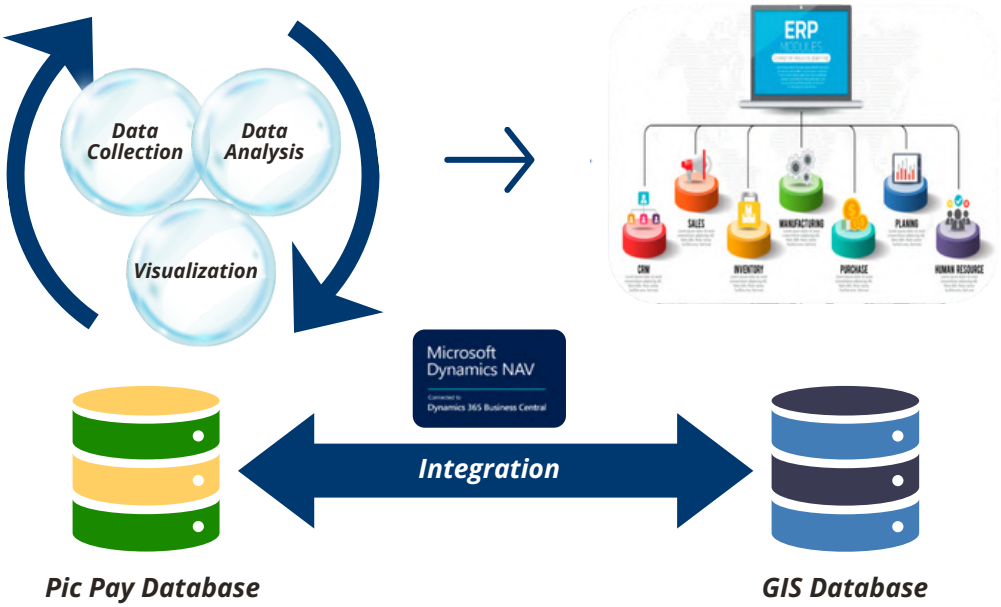

Figure 11 NAWASSCO's proposed seamless sanitation data integration

6. Self-Service Module

The self-service module runs on Microsoft Dynamics and enables NAWASSCO staff to perform internal operation functions. Staff members can use the module to handle:

- Human resource functions e.g., performance management, personal development, leave management training and evaluation.
- Procurement functions: Stores and purchase requests.
- Finance functions: Payment of all internal and external services, imprest/petty cash, and surrender of imprest.

Staff access to these functions depends on their role and level within NAWASSCO. For instance, managers can approve leave plans and requests through the self-service system.

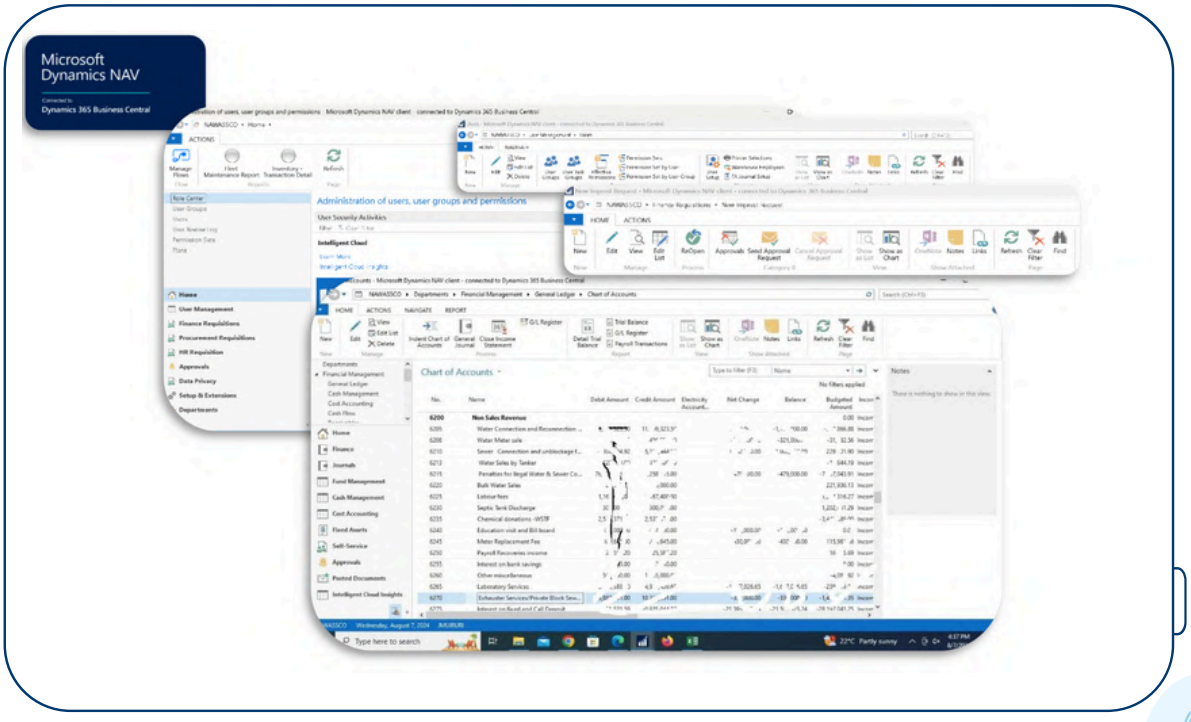

Figure 12: Integrated Microsoft Dynamics NAV with the ERP, an example of the Finance module showing exhauster services revenue

This document was developed by Dev-Afrique Development Advisors in collaboration with Nakuru Water and Sanitation Services Company (NAWASSCO), the Eastern and Southern Africa Water and Sanitation Regulators Association (ESAWAS), and the Global Water Operators' Partnerships Alliance (GWOPA).

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