IMQS: MAINTENANCE MANAGEMENT

GRAP-17 Compliant Maintenance Management
Software Solution

MAINTENANCE MANAGEMENT MODULE

IMQS Software helps overcome key maintenance management challenges with a geospatial, GRAP-17 compliant web-based Maintenance Management software package.

The infrastructure-management-specific software has been developed to make the every-day tasks of municipal engineers and technicians easier. From incident logging and maintenance scheduling to managing resources, time and cost, IMQS has packaged Maintenance Management into one system that links directly to a municipality's Asset Register. IMQS integrates, automates and unifies all maintenance-related data sources, processes, and reporting, presenting information in different views on an intuitive GIS web-interface.

TECHNOLOGY

IMQS is a web-based enterprise application software that enables effective infrastructure lifecycle asset management. The software consists of collection of web-services and components that are supported by specialised tools and frameworks. The core platform provides an extensive set of generic functionalities than together make the implementation infrastructure management products possible. Due to its high level of configurability and ability to combine componentised sets of functionality, IMQS offers a highly flexible a framework able to produce tailored made solutions. Users primarily interact with the IMQS service through a browser-based front-end, which is additionally supported by tablet-based apps.

Interfaces for the enterprise software follow REST principles, both internally and externally. All constituent services have a published API as their primary interface. These interfaces are the foundation on which the browser-based front-end is built. Standard protocols, like HTTP with JSON payloads, however, make it effortless for third parties to consume them for integration purposes. Authenticatio n and authorization services enable security on the interface level.

WHO WE ARE

IMQS builds specialised, GIS-centric software for the Infrastructure Asset Management market. This means that we are committed to conceptualising and constructing solutions for real-world problems that impact the lives of people, at all levels and from all communities, on a daily basis. It is our business to think of innovative ways to enhance the value of your organisation's physical assets, while you focus on the work that matters – delivering key services to your valued customers. IMQS's software is currently enabling effective decision-making, service delivery and customer satisfaction in over 100 government and private organisations in South Africa and the internationally.

TECH BENEFITS

- Cloud-based
- Seamless deployment
- Fast and Secure
- Customizable
- User-friendly
- Mobile

IMQS IN NUMBERS

- **143 534 km** combined length of water pipes
- **3 892 086** lines of code used to program our software and counting

IMQS's Version 8 stack runs on enterprise operating systems, including Linux (with Docker containerisation) and Microsoft Windows Server. Database technologies include Microsoft SQL Server and PostgreSQL, which are both tried and tested in high-demand environments.

A dedicated DevOps team manages the challenging and unique environment of on-site deployments from a central point. IMQS DevOps makes use of in-house developed, fit-for-purpose tools to manage client-specific data and configuration. The IMQS operations team attends to monitoring server health and service performance by using state-of-the-art monitoring software. This enables fast detection and pro-active response to developing issues in the production environment.
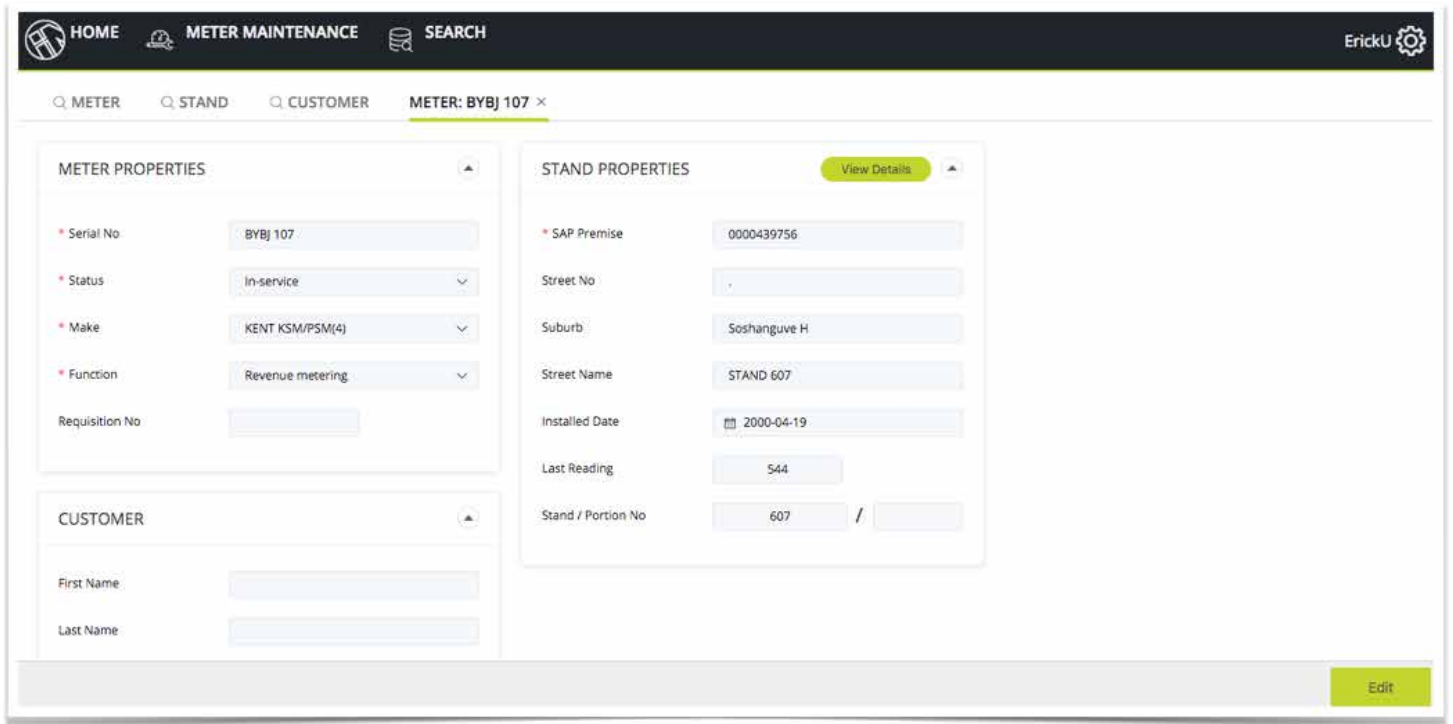

Image 1: Water Meter Maintenance Detail Screen

KEY FEATURES

GEOGRAPHIC INFORMATION SYSTEMS

The GIS functionality implemented in IMQS depicts a municipality's infrastructure landscape in various layers on a spatial map. Each layer offers a detailed representation of asset information, which is categorised according to a legend. For example, a pipe network could be categorised according to pipe diameter, in which case each range of diameter is colour-coded on the map for easy identification.

INCIDENT LOGGER

The Incident Logger sub-module enables the capture and processing of incidents from the logging of requests and the allocation of an incident to a depot to the processing of tasks. Task are processed by calculating maintenance-task costs according to information: 1) the team completing work; 2) materials used; 3) equipment used; 4) vehicles used; and 5) the progress of the work.

THEMES

In IMQS, themes provide a user with the ability to display data spatially in the form of shapes, symbols and colours. A theme comprises multiple layers, where each layer contains data of the same such as pipes. Each layer in turn uses one field within the dataset. This means that values contained in the field are grouped into ranges and each range is then reflected as a specific colour on the GIS Map. The data is then displayed as a point, line or polygon on a map, where the colour and symbol is defined by the theme.

BESPOKE REPORTING

IMQS offers standard engineering reports that can be viewed on a built-in reporting platform. The reporting platform includes standard reporting tools such as filtering on report or global level, but also more advanced capabilities that produce more complex reports, that may include graphs.

COMPREHENSIVE DATA GRIDS

Comprehensive Data Grids display data on a GIS Map in a list format. Users are able to find a range of features, such as pipes, based on simple or more complex joint-filtering criteria.

TIME & COST

This sub-module is used to create maintenance-team time sheets. Teams are required to complete a daily time-sheet that capture: 1) the incident worked on, as well as the progress and time worked; 2) the team involved; 3) the materials used, 4) the equipment used; and 5) the vehicles used. Time and cost can also be used to close incidents if the work is completed. The timesheet is completed by hand by a team lead, or timesheet-supervisor, who in turn gives it to an administrator in charge of capturing the information on IMQS.

RESOURCE MANAGER

The resource manager sub-module is used to manage the list of possible resources and their availability and enables the efficient management resources required for maintenance planning. Resources are divided between employees and contractors. For employees, the available time is determined according to: 1) standard-time pay days; 2) public holidays; and 4) leave management. Employees are divided into positions set up and managed in an organogram section of the module. For contractors, the available time and resources allocated to either contracts or agreements.

INVENTORY MANAGER

The inventory manager sub-module is used to manage the list of available inventory items and the employee/contractor to whom they are assigned. The inventory items include: fleet; material; equipment; meters; and informal stores. The sub-module enables the better management of material required for maintenance-planning and expenditure purposes.

CLOCK

The clock sub-module is used to display and maintain clock records. Employees clock-in using an access control button. This button is linked to each employee under the sections: **Resources - Employee**. The clock records are downloaded on a weekly basis and imported into IMQS.

FINANCE

The finance sub-module is used to define the project codes that link the related maintenance costs to relevant cost-centres and general ledger accounts. Finance-related lookup fields include: tariffs; project code; and SAP projects.

WATER METER MANAGER

The purpose of the water-meter manager sub-module is to combine all meter-related information and display the data in one central location. Information sources include: stand-related GIS data; historical stand-related incident data; and stand-related SAP data displaying account information.

MEMO TOOL

The Memo Tool enables its user to report data discrepancies on the model via the IMQS web-browser, when incorrect data, reflected in the model, is compared to actual inspections. The user can identify the model feature, like a pipe, on the GIS Map and report the discrepancy to the engineering firm responsible for the maintenance of the model via an automated emailing system.

CONCLUSION

The IMQS Maintenance Management Module empowers municipal agents to better plan and manage infrastructure maintenance. This innovative software package supports informed decision-making and enables coordinated workforce execution. By consolidating all engineering and financial asset information on one GIS-centric web platform, users gain an informed and interactive view of their entire maintenance environment to plan and execute both scheduled or unscheduled maintenance. All relevant data, from early warning signs to material shortages, is made easily available to inform rapid proactive and responsive decision-making. The module empowers work teams by affording them with accurate incident information, reducing the risk of making decisions based on dissimilar data sets. In so doing, this software package helps municipalities achieve greater customer satisfaction by ensuring unbroken service and concise communication. The visualisation of information, as well as innovative reporting functionalities, makes IMQS a key node in the communication between municipal stakeholders, departments and the public. While IMQS maintains its own powerful GIS system, the module integrates effortlessly with other GIS ERP systems, such as ESRI. This offers users the freedom to work on their preferred GIS platform without having to waste time by switching between systems.

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