

Overview

Modam is a Modular Platform capable of meter data analysis and collection and offers new possibilities for the utility sector with solutions for energy suppliers, grid operators, metering companies, energy service providers to offer innovative and attractive services. Modam platform provides useful and practical results and insights, helping all utility sector companies do better performance growing and optimizing the grid network. Benefiting from a very powerful engine, Modam provides a Fast, Reliable and Stable collection for utility companies that demand accurate and on-time data. Modam manages all customer information and legal processes in utility companies and can calculate and issue bills for customers consumption. Benefiting from powerful workflow engine, Modam enables utility companies to have all their work routines all in one place, optimizing work performance and reduces multiple systems maintenance costs for utility companies. Modam provides user-friendly and practical tools to utility managers enabling efficient management of energy grid. Modam encompasses a portfolio of field-tested, analyzing large amount of data and revealing patterns, trends and complex reports combined with a results-driven deployment approach delivers greater business insights with less risk than other alternatives. The Intuitive user interface reduces the costs of user education resulting in lesser employee preparation period.

Modam®

Meter Data Management Software

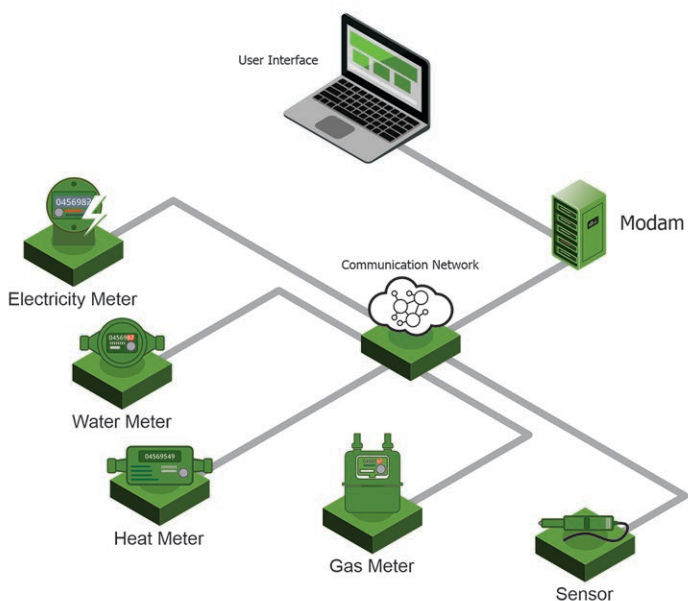
Advantages

- Modular design principle and the Modam Modules ensure easy adaptation to new requirements and your own business goals
- Fast and reliable collection of data from electricity meters installed in the power grid
- Estimation and Validation of the collected data
- Comprehensive and Dynamic reports
- Management of all customer legal processes
- Managing internal workflows and processes
- Billing and customer bill management
- Offline geographical customers map
- Energy Grid Management
- Intuitive user interface, reducing training and operating costs
- SaaS, cloud concepts or non-site installations enable implementations seamless scaling from small pilots to large scale roll-outs

Smart Energy Grid

Having a smart network that collects volumes of data from residential and commercial electricity, water, gas and heat meters and is able to configure them, utilizing a robust communication core, data and customer management, and billing solution is essential for the utility sector. Providing secure, accurate and reliable data, Modam delivers operational efficiency that defines new frontiers to the business value.

Systems that operate with multiple isolated systems and databases, are prone to great bottlenecks, data losses and IT problems which lead to unoptimized resources, increasing staff and management costs thus reducing the efficiency of the whole system. Making the whole system as one integrated smart, fast, reliable and optimized smart network reduces the costs of field service, transferring data, providing real-time data needed for managing and growing the grid infrastructure to whole utility sector and customers.



Improving grid reliability, operations and customer satisfaction means collecting, validating, analyzing and acting on quality smart device data securely maintained in your data management system. To make these business activities function seamlessly, utilities rely on a data management system. Data management systems provide an ideal remedy that creates a system of record where consistent, secure and auditable processes are enforced, and where all users and external systems can access accurate and reliable data from smart meters.

Modular Design

Designing and developing a software in modular structure is crucial for large-scale software systems. It reduces support and development time, enabling software developing companies to provide better and efficient solutions faster, providing customers the service, they need in much shorter time resulting in business value growth. This structure also enables rare bugs to be fixed just by altering a certain part of the software. This also makes changes and upgrades much more reliable for customers as there

are many bad structured software which by each upgrade cause many problems for users, thus reducing productivity and causing great financial losses. Modam utilizes modular design principles which makes it a reliable, fast and powerful software made to provide benefit and business value to the customers. Modam MDM consists of various modules as follows.

Available modules:

1. Collection Core
2. Customer Service
3. Customer Management
4. Billing
5. Work Order Management
6. Report Builder

These modules are independent thus they benefit from each other's data and structure fast and smooth. Other features requested by our customers can be implemented in the form of a module that provide the very best solution available to the customers.

1. Collection Core Module

Collection Core is a powerful engine based on advanced architecture that does the core scheduling, collection and estimation of consumption data from metering equipment (e.g., energy meters) and has the capability to configure meters.

This module has the ability to manage energy grid, the collected data and provide various and practical reports. Collection Core Module is also modularly designed and implemented, and consists of three sub-modules:

- Energy Grid Management
- Operation and Scheduling System
- Communication Drivers for collection and configuration of metering equipment

In the Energy Grid Management Module, utility managers can define, monitor and moderate grid production and consumption. Modam provides of all grid physical and virtual equipment, grid elements and reference meters with all related attributes from communication details to business characteristics for each node in the grid management sub-module. Modam is capable of managing virtual equipment, sensors, meters and DMAs, enabling utility managers to manage production, consumption and waste or leakage efficiently. This Module enables calculation of waste and leakage between reference and sub-meters in the energy grid.

With Scheduling and Operation System Module, all system operations can be set and scheduled e.g., equipment data collection and configuration, estimation, VEE, virtual meter calculations and etc.

Collection and configurations for each metering equipment is handled using communication drivers which can be deployed separately providing customers with choice to have only means to communicate with their installed or intended metering equipment model and also dynamically define which of the parameters they want to collect or configure. This will result in much lesser and

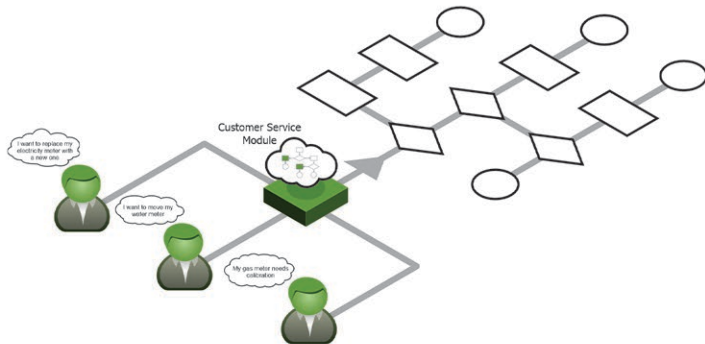
efficient purchase and also if more meter model collection or configuration feature is requested by customer, then only the new driver will be added to the system without disrupting any other driver functionality.

There are cases in which customers collect meter data using another HES software or data is collected using hand-held devices. In these situations, customers will only get this module without communications driver sub-module, enabling them to collect data from external APIs into Modam MDM system.

2. Customer Service Module

Customer service is one of the Modam platform modules that encompasses all customer processes that deal with utility companies (e.g., customer registration, new branch request, meter replacement, meter relocation, ownership change, meter inspection and testing, general billing, etc.) thus speeding the processes and easing legal customer matters management. This module also manages the financial issues of the customers by keeping track of the debts and credits.

Customer service module provides cartable and workflow system that provide employees and specialists easy means to check and act on tasks assigned to them. Modam benefits from powerful workflow BPMN engine which enables developing all customer needed workflows and can provide modular workflow management and development.



Other than customer related workflows which in many cases are routine in all utility companies, all other internal workflows and even custom flows which are conducted in utility companies can be easily implemented in Modam and used. This enables utility companies to have all their work routines all in one solution, reducing many maintenance costs.

3. Customer Management Module

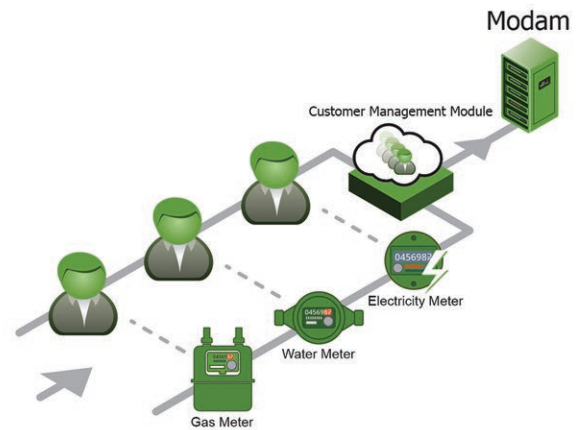
Customer management module as a part of Customer Service Module, is responsible for storage and management of all customer information. The management of reference and sub-meters, customer power outages and central cross business management of metering equipment (e.g., electric, gas and water meters).

All collected consumption data is transferred to customer management module and this data is used to provide comprehensive and practical operations and reports.

All customers can be continuously monitored via geographical

map that is designed to provide insights on consumption status of the customers and generate different alarms on incidents collected from meters and sensors. This feature also enables utility companies to see the visualized energy grid and eases network management and development.

The customer map shows all registered customers and their reference meters and sub-meters and enables consumption calculation based on selected area on map. The geographical customers map is designed to work without internet and utilizes latitude/longitude and UTM coordination system, and also satellite and street views are usable.



4. Billing Module

Billing is one of the Modam platform modules that is responsible for calculating and issuing customer consumption bills and related practical reports. This module uses all financial and consumption data of customers from customer service systems and issues bills according to standard calculation and tariffication rules and formulas. Standards for bill calculations may differ in various countries, based on the country or utility rates policies. Modam's billing module enables dynamic formula management for utility managers, enabling them to easily define, edit and use billing formulas for different types of customers.

The reports designed and implemented in this module provide comprehensive and practical information on all billing data of customers, enabling utility companies to manage consumption and the income according to energy production.

5. Work Order Management Module

Energy grids need constant and scheduled maintenance to keep the consumption measurement accurate and customers satisfied. As long as the energy grid is monitored, inspected and kept efficient, utility companies will not have to tolerate tremendous costs related to inaccurate measurements, meter hardware faults, grid faults and can reduce them to a meaningful and rational minimum.

Modam provides an environment to create, manage and monitor work orders for regular and percuse inspections for a single or group of meters. Utility managers can also manage the association of inspectors with handheld devices and with comprehensive reports, will be able to track the work order

fulfilment. Inspectors will receive work orders on their handheld devices and will carry out the tasks and will send the results to the MDM system after completion.

**Attention: Target device applications must have work order capability and API for receiving and uploading work order data. If by any means this functionality is not available, then German Metering can deliver the application by request.*

6. Report Builder Module

There are many reports that are generated as the business grows, and per utility company they are different as the scope of energy grid from hardware to whole topology is different. Therefore, having a dynamic report builder module provides utility manager best means to manage their energy grid efficiently.

Modam delivers a Report Builder Module consisting of custom report generation and dashboard creation features. Utility managers can define parameters and generate various charts based on their needs and business values.

Reliable Collection

The most important part of an MDM system is the data and more important the reliability of it. Reliability means data being accurately read from meters in predefined schedules without any system faults using powerful engine, resulting in regular, valid flow of data used to monitor, manage and develop the electricity grid providing operational efficiency and revolutionizing business value.

VEE Analytics

In monitoring and reading meter data, there are times that faults in the grid network or meter itself can cause missing data or wrong data. In these cases, Modam has validation and estimation scenarios that are implemented in the engine and are customizable in many options by the customers, that depending on the configuration, it intelligently recognizes the false or missing value, calculates and replaces the data.

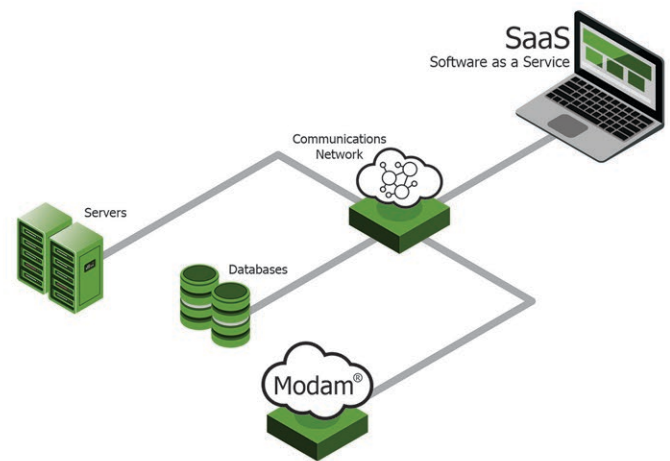
Validation rules help recognize the meter faults resulting into invalid data such as value in the future, data being lower or greater than average, data being lower or greater than a defined value per meter, negative consumption, value in the future and etc. Estimation rules help fill missing or invalid data according to the configured values. Missing data can be caused by power outages and meter malfunction. Invalid data on the other hand, can be caused by many situations including meter malfunction in tariffs, load profiles, date and time errors that can cause value in the past or future by the configured interval, faults in defined ratios and etc.

VEE also can help identify faults in the network and meters, resulting in great missing values reduction and providing reliable data to the customers.

Non-site installations (SaaS)

Having a comprehensive software also generates the need for a set of servers to be installed and maintained on. There are customers with certain degree of security guidelines which are obligated to purchase and maintain a local datacenter and install the MDM software on that configuration. On the other hand, there customers which do not wish to purchase and setup such costly datacenters. There are many reasons that convinces customers not to setup a datacenter locally, such as setup and maintenance costs, limited number of metering points, no hardware upgrade needed when number of metering points grow, workplace availability over the internet making it possible to work from anywhere, not needing to upgrade to newer versions provided by developer, and etc.

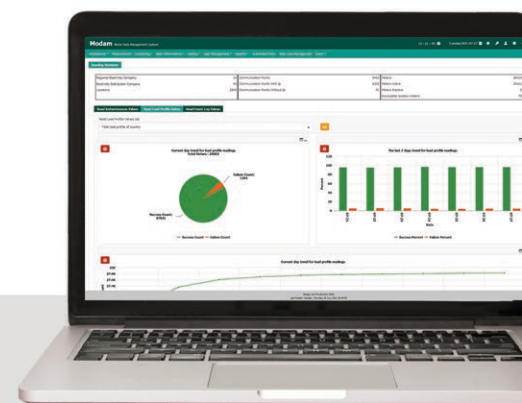
Modam is designed to be installed both on-site and non-site, providing customers with variety of choices in utilizing it to their benefit, as it diverts the implementation costs towards business growth.



Intuitive user interface

The operation education costs are of highest resource wastes that many companies endure. Also operating with multiple isolated systems and databases increases the education costs of employees and more than that, the rate of human errors leading to not reliable data thus reducing the business value. This normally increase when migrating to a new system.

Having an intuitive user interface that is designed by years of experience in the field and study over user experiences, reduces the costs of education by a great measure. An intuitive user interface provides a user-friendly environment that user performs all business-related processes without need to be educated. The only education needed for the employees will be the business itself.



Meter Data Management Benefits

- Reduced field service costs through remote connect and disconnect and on-demand read capabilities.
- Effortless management of energy customers such as electricity, water and gas
- Reducing the number of maintained systems between collection, billing, outage, engineering and work management systems by having a stand-alone comprehensive system.
- Increased quality of data by operating a single, central system, instead of separate and inconsistent systems.
- Reduced IT implementation and maintenance costs
- Improved data reliability with automated, valid data reading straight from the meter
- Reducing data losses through VEE implementations
- Reducing manual intervention for residential customers, leaning focus on your most demanding customers
- Improved security and accountability through consistent auditing and versioning of all data

Technical Specifications

- System architecture: Layered with logical subsystems, and SOA based
- Implementation platform: Web Base, Browser and device Independent
- Database: RDBMS with SQL Server 2019
- Communication with other related systems: SOAP with WCF
- Framework: .Net Framework 4.5
- Programming language: C#

Applications

Modam platform has the ability to communicate, collect, send and receive information of various types of equipment such as smart meters (electricity, water and gas), remote reading modems, sensors, measuring equipment, instrumentation, etc. It can be used in various businesses such as:

- Electricity generation and distribution companies
- Water production and distribution companies
- Gas production and distribution companies
- Petrochemicals
- Refineries
- Airports
- Industrial estates
- Business centers
- Passages
- Residential complexes
- etc.



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