Automatic Meter Reading (AMR)

Overview

The technology of automatically collecting consumption, diagnostic, and status data from water meter or energy metering devices (gas, electric) and transferring that data to a central database for billing, troubleshooting, and data analysis.

Applicable Industries

- Aerospace
- Agriculture, Forestry & Fishing
- Automotive
- Chemicals
- Electronics & Embedded Devices
- Construction
- Consumer Goods
- Food & Beverage
- Furniture & Home Appliances

- Healthcare Services
- Heavy Vehicle
- Equipment & Machinery
- Medical Devices & Equipment
- Mining
- Paper & Pulp
- Pharmaceuticals
- Plastics & Rubber
- Rail & Metro
- Renewable Energy
- Shipping
- Smart Grid
- Telecommunications

Applicable Functions

- Environmental Health & Safety
- Facility Maintenance
- Maintenance

Case Studies

Transforming Water Utilities with IoT, saving a Billion Gallons every year!

The big problem that Utilities face includes:(i) How to make meters “smart” and ingest the data from homes to the companies and;(ii) how to derive intelligent actions from huge amounts of ...

Market Size

Estimate A

The US market for automatic meter reading reached USD 4.4 billion in 2016, growing with a CAGR of 11.3% up to this point.

Source: Freedonia Group

Estimate B

Another source predicts the global market for smart electricity meters at USD 20.0 billion in 2020.

Source: U.S. International Trade Commission

Estimate C

Japan smart electric meter market is predicted to witness a paradigm shift owing to adoption of AMI products. In August 2015, Tokyo Electric Power Company (TEPCO) launched an initiative to install over 2.7 million intelligent systems across the country and offer 24-hour customer support service through a Smart Meter Operation Centre.

Source: Global News Wire

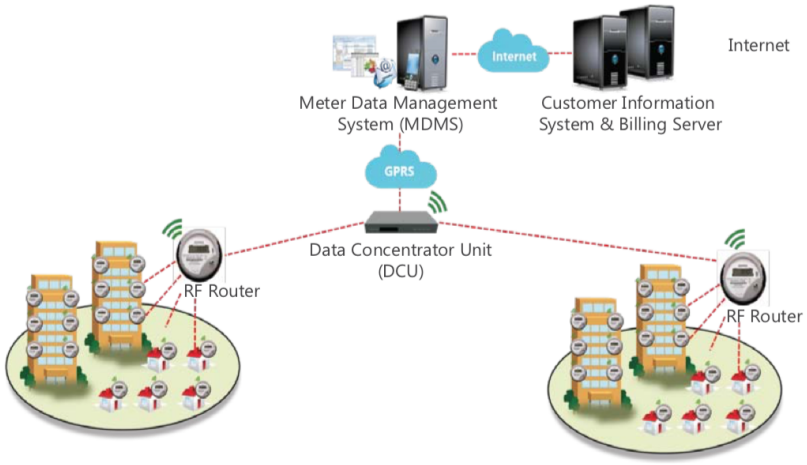
User Viewpoint

Business Value

How does this use case impact an organization’s performance?

Automatic meter reading (AMR) capabilities increase billing accuracy and enable companies to better manage utility water usage. AMR systems consists of small,

low-power radio transmitters connected to individual meters that send daily readings to a network of receivers. AMR eliminates the need for meter reading personnel to manually check readers and provides timely data from remote locations.



Advanced metering systems can provide benefits for utilities, retail providers and customers. Benefits will be recognized by the utilities with increased efficiencies, outage detection, tamper notification and reduced labor cost as a result of automating reads, connections and disconnects. Retail providers will be able to offer new innovative products in addition to customizing packages for their customers. In addition, with the meter data being readily available, more flexible billing cycles would be available to their customers instead of following the standard utility read cycles. With timely usage information available to the customer, benefits will be seen through opportunities to manage their energy consumption and change from one REP to another with actual meter data. Because of these benefits, many utilities are moving towards implementing some types of AMR solutions.

Key Performance Indicators

How is the success of the system measured for users and for the business?

Two way data sharing between meters and CRM/billing systems.

System Capabilities & Requirements

What are the typical capabilities in this use case?

AMR meters pick up a mobile signal, they automatically and accurately read how much electricity is used and sends it to the data center every month.

Performance Requirements: Correct setup and constant reading of parameters and data.

Deployment Environment

Where is the 'edge' of the solution deployed?

Integration of every utility end user. Customer homes need to be equipped with smart meters.

Technology Viewpoint

Sensors

What sensors are typically used to provide data into the IoT system, and which factors define their deployment?

Utility usage tracking.

Analytics

What types of analysis are typically used to transform data into actionable information?

Real time analytics sent to the data center in order to analyze usage, possible leaks and gives information on how to reduce costs.

Cybersecurity

What factors define the trustworthiness of the solution?

Possible security threats ranging from data falsification and the ability to remotely control the meter. As with all home systems, it is necessary to take the necessary precautions.

Cloud & Edge Platforms

What factors define the cloud and edge platforms used to integrate the solution?

Solutions to transfer the usage data in real-time to the utility provider.

Connectivity

What factors define the connectivity solutions used to provide both device-to-device and device-to-cloud communication?

Radio transmitters take readings from the meters and send them to a hub which forwards them over the GSM network and makes the data available securely via the internet.

User Interface

What factors define the interfaces available to the system users?

Different kinds of user interfaces for the different kind of end users, e.g. accessible and user-friendly interface for the customer home solution.

Data Viewpoint

Data Sources

How is data obtained by the system?

Usage tracking sensor.

Data Types

What data points are typically collected by the system?

Electricity, water, gas data gathered for further analysis.

Data Volume

What volume of data is expected from each deployment, and from the system as a whole?

Volume depends on usage.

Data Requirements

What other requirements define data behavior?

Data must be transferred in real-time to enable pay-as-you-use payment systems with price adapted to time of day etc.

Implementation Viewpoint

Business & Organizational Challenges

What business challenges could impact deployment?

There are a few challenges for adoption of AMR's which include: Upfront investment as the AMR demands a completely new infrastructure which need to be financed, Employee costs as there needs to be new employees and departments such as a separate customer service department, customer data privacy in order to ensure the consumers' data is safe and cybersecurity issues as the product is prone to hacking.

The high cost of investment into the system is a challenge for adoption for many organizations.

Integration Challenges

What integration challenges could impact deployment?

The integration with other IT systems is paramount as the main benefit of the system is an integrated "IT suite" that provides reliable data. Most technology providers have little or no experience in integrating the system with other IT structures.

Installation Challenges

What installation challenges could impact deployment?

There needs to be a clear line of sight between the transmitter and receiver. Furthermore, the registers and meters must be paired by size, model and registration type. Failure to do so might lead to inaccurate readings.

Regulatory Challenges

What regulatory challenges could impact deployment?

Data security and data privacy is still strictly regulated throughout the globe.

IoT ONE Use Case

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