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# Internet of Utilities Asset Management

by Praveen Kumar Agrawal and  
Sunder Rao Edulapally

**W**ith the advancement of new technologies, the world is moving toward intelligent devices and assets. Although sensors have been around for a long time, they have always been local to a machine and do a specific job, without much communication to the outside world. But if these sensors can communicate with other sensors, machines and human beings over the Internet, then this setup can form an Internet of intelligent devices.

This interconnected intelligent device setup can further be augmented by software, simulation techniques and algorithms to bridge the gap between information technology (IT) and operational technology (OT), and thus help machine operators and supervisors to quickly find a problem area, make quick decisions and act to reduce machine failure.

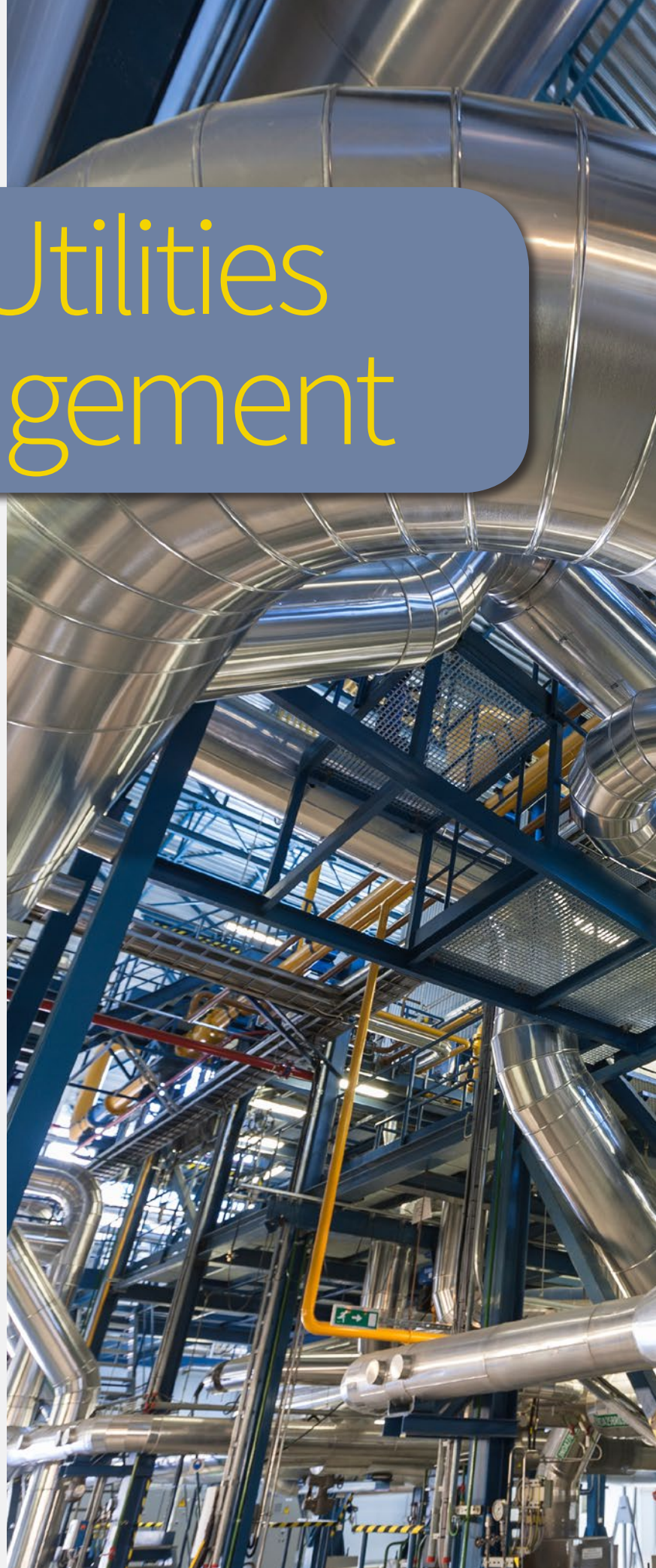
This point of view delves into this phenomena of smart connected devices and assets, their real-time interactions and overall impact on utilities.

## The Asset Management Issue

Asset management is a critical function for asset-intensive industries, especially utilities. Over the decades, many asset management philosophies and frameworks have been introduced in the market and many software application vendors supported these thoughts in their asset management solutions. These asset management solutions helped organizations to understand their assets and accordingly, strategize investment and maintenance programs.

But these asset management software solutions alone are not able to provide useful information for decision-making in operating critical assets. These solutions require a significant amount of data for effective functioning and thereby, significant efforts in collecting this data. Still, the objective of having the right information on a real-time basis is not being achieved and is not sustained as information changes over time due to modifications in asset attributes. This problem is omnipresent in utilities with aging infrastructures and geographically distributed assets exposed to a wide variety of hostile environmental conditions.

Utilities have tried to gather real-time machine operating parameters by using supervisory control and data acquisition (SCADA) for utilities, but the SCADA systems are mostly used for network monitoring and operational purposes and don't provide real insight into asset functioning.





## How IoT Can Help Asset Maintenance

Today, utilities struggle to find exact fault locations and related asset condition. Field crews and supervisors spend significant time trying to find the exact location and reason of faults, thus causing a delay in rectifying faults. Electrical utilities have some level of maturity if they are using an outage management system (OMS) for finding failure location, but that too provides only basic information and requires human intervention to complete the details. Generally, water and gas utilities have no such mechanism, as the assets and networks in these utilities are much more aged than electric assets and often are not connected with SCADA or OMS.

Internet of Things (IoT) enabled machines, with the help of sensors attached to them, can communicate their geographical information, operating parameters of all connected devices, environmental parameters and many more information elements over the Internet to machine operators and supervisors on a real-time basis.

Utilities invest a significant amount of time, money and effort to do repetitive inspections to avoid faults and outages. But the majority of these inspections can be avoided if utilities' assets are IoT enabled so they can communicate information about the asset condition before failure.

Imagine IoT enabled assets communicating information over the Internet so finally the exact location of the outage is determined and maintenance crews are informed about the outage in no time. Then, the outage information and location can be directly posted to social media without human intervention and communicated to utility customers. The whole process can be automated to the extent of automatic scheduling and dispatching of maintenance crews based on their real-time availability, location and skills. Request for permits can be automatically initiated based on the nature of fault.

Another example of automation could be the installation of smart and intelligent poles and streetlight holders. They can make streetlight inspection totally automatic, as the holders can directly communicate to the IT system that a bulb is non-operational. This way, maintenance and stores personnel are well-informed about the quantity required and where to replace.

## Conclusion

The IoT is changing the world and utilities are no exception. Lots of maintenance money currently being spent on repetitive inspections based on old-school thoughts and aging infrastructures can be saved with IoT. Machines can speak about themselves before the failure and provide automatic alerts, thus kicking off the whole predictive maintenance engine.

However, because utilities have relatively old infrastructures compared to other industries – 50 to 100 years old in many cases – it will take some time before utilities start realizing the IoT benefits.



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