

Enterprise Case Study: Solving the Problem of Managing Connected Devices

How Elster addressed connected asset management with mobile workforce management

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Summary

Catalyst

Mobile technology has advanced significantly over the past decade. The speed with which the consumer smartphone and tablet market has grown far outstrips the pace of change in enterprise mobility, particularly mobile asset management. A couple of years ago, field engineers were using intuitive apps on touchscreen handsets in their personal lives, but when they went to work to perform work tasks in the field they had to switch their smartphones off and revert to clunky ruggedized laptops running poorly designed software. Smart handset adoption in the enterprise is now catching up with consumer markets, laying a foundation for more flexible apps to support field operations. By giving employees secure and reliable access to mobile apps that help them perform key asset management tasks, wherever they are, businesses can significantly improve engagement, efficiency, and productivity.

This revolution in mobile apps for asset management comes at a time when the assets themselves are undergoing a revolution of their own. Many enterprises with assets that have to be monitored, tracked, or measured are investigating how to deploy Internet of Things (IoT) technology across their asset bases to improve operational efficiency and customer service. However, connected assets require a different approach to asset management. Asset management apps have to include specific workflows to test, maintain, or replace an asset's communication module. In most instances this requires direct communication between the field worker's handset, the connected asset, and back-end systems. Few "connected asset management" apps currently exist. This case study looks at smart meter manufacturer Elster's use of mobile workforce management software that has this functionality.

Ovum view

This case study focuses on smart metering, a relatively mature subsector of IoT technology. However, the lessons learned are relevant for any enterprise deploying connected sensing and control equipment across its asset base. Elster's mobile workforce management project highlights a significant gap in the market for companies that require connected asset management applications. Mobile application vendors are split into two distinct camps: those that can cope with the additional requirements of connected assets, and those that cannot. Unfortunately, the majority are behind the curve. Retriever Communications' ability to serve up multiple forms of information via its mobile app, including content not directly related to specific workflows, was a critical success factor in the bidding process. It also demonstrated that its software can include direct communication with Elster's meters, another criterion that set it apart from its competitors.

Elster's approach to workforce management was transformed by its use of Retriever software. Elster transformed its mobile workforce capability to deliver a more efficient and better quality service to its utility clients. The unique software functionality that allows direct connectivity between handsets and gas meters means that Elster is well placed to secure its position as a leading service provider to the Italian smart gas meter market. It also gives it a strong competitive edge to secure service contracts in the deployment of residential smart gas meters in Italy in 2016.

Key messages

- Connected assets require more sophisticated management.
- The transition to connected devices marks a significant change to business models.
- Retriever Communications' configurability and flexibility help Elster better manage its smart gas meters.
- Elster's smart gas metering project highlights the additional requirements of future connected asset management to deliver customer satisfaction.

Recommendations

Recommendations for enterprises

Elster's experience with mobile workforce management and the deployment of apps to its field engineers demonstrates the efficiencies that can be achieved by mobilizing key tasks for specific workers. Elster identified the processes that could be improved with mobile technology, and once the decision had been made to do so, it moved quickly to find the right solution and roll out the required apps.

Enterprises in all verticals can improve inefficient business processes by using mobile apps, allowing workers to complete core tasks on the move – without needing to return to an office to file paperwork or upload from a PC documents that complete a job. An IT department cannot identify these opportunities alone: there must be a mechanism in place for line-of-business owners and end users to advise on how their everyday working practices can be improved. Some businesses have achieved this through cross-business mobile centers of excellence or dedicated digital transformation teams.

Selecting the right provider to roll out any apps is the next key step: it is important to have a clear idea of what specific capabilities the apps need from the outset, and to select a mobile app vendor that is clearly able to provide them. Elster identified Retriever Communications, for example, due to its flexibility around workflow requirements and ability to communicate directly with devices in the field – something that other vendors could not easily offer.

It is also important to ensure workforce management software can adapt to the rapidly evolving device market. While a new mobile software project will likely see an upgrade to one or a handful of different devices, the device replacement cycle will be much shorter than software, and replacement devices may come from different manufacturers, use different versions of an operating system, or use different operating systems altogether.

Finally, a gradual, step-by-step deployment enables robust user testing to take place and fixes to be made before a general companywide rollout. As Elster demonstrated, this process does not necessarily have to take a huge amount of time – but it makes sense to build time into a project plan to make sure that an app is fit for purpose before it is rolled out to the business. Deploying a flawed, unintuitive app risks low adoption and poor workforce confidence, and ultimately reduces its return on investment.

Recommendations for vendors

This case study highlights a gap in the market for mobile workforce management (MWFM) apps that incorporate the additional functionality required by connected assets.

It is essential that engineers communicate directly with any IoT device during installation, maintenance, inspection, and replacement. Therefore, any MWFM application has to include functionality that incorporates communication with a device and integration with back-end systems. It should also include the ability to serve up information and files not directly associated with field-force workflows. From Elster's selection experience, few vendors currently support this functionality.

Elster used a local provider to develop the application that manages the direct communication with the smart meter. There are many reasons for this, including the requirement for specific knowledge of the Italian regulatory regime. However, we envisage that as the IoT market evolves, enterprises will increasingly demand a seamless experience for their field workers. As a result, mobile workforce management vendors will have to incorporate more functionality to support the workflows associated with connected assets we discuss in this report.

Using mobile apps to manage connected devices

Connected assets require more sophisticated management

Elster has a significant share of the Italian smart gas meter market

Elster is a German manufacturer that provides gas, electricity, and water meters and related communications, networking, and software solutions. It has customers in more than 130 countries, which have installed more than 200 million meters over the last decade. It employs 7,500 staff in 39 countries. Elster's customers include utilities, power distributors, and industrial customers for use in residential, commercial, and industrial buildings. This case study looks at Elster's use of a mobile workforce management solution in the Italian smart gas meter market.

The Italian gas industry is fragmented and is undergoing extensive industry change, principally caused by the mandated rollout of smart gas meters. Elster's Italian target customers are the gas distributors, of which there are more than 150. Two companies have approximately 50% of the market, and 10 control 80% of the market (there are a lot of small, municipal utilities serving very few customers). The two largest suppliers are both Elster customers.

In 2010 the gas regulator mandated gas metering for all commercial and industrial customers, and will begin its domestic smart gas meter rollout in 2016. Italy is no stranger to smart metering; it was the first country to deploy smart electricity metering for all residential customers, a process that started in 2002.

At present, Elster has about 20% of the Italian commercial and industrial gas metering market. It has 15,000 smart meters under direct management, but provides ad hoc maintenance services for a further 40,000. However, the market for smart gas metering in Italy is about to explode. At present, only commercial and industrial customers have a smart gas meter. There are approximately 22 million domestic gas users in Italy, 14 million of whom will have a smart meter installed in the first phase of the smart metering deployment, which began in January 2016. Given its market share in other geographies, Elster can expect to install about 20% of these meters. Elster is also a qualified meter

inspector (which requires a regulatory license), which means that its engineers will be required to inspect gas meters regularly.

The transition from analog meters to "smart" meters marks a significant change to Elster's business model

Previously, Elster was more of a "box-shifting" manufacturer: it would build meters to order and ship them to its clients. However, these meters had relatively basic functionality, with only the ability to measure the flow of gas and a display to record units used. The meters had no way of communicating consumption data, so had to be read manually by a meter reader. Smart meters come with two-way communication and advanced functionality, such as tamper alerts. Elster now sells meters as part of a service. Rather than delivering a box, Elster will install and verify the meter in the field, with the option of providing an ongoing maintenance contract.

In 2010, when Elster began installing smart meters, it had little IT to support its mobile workforce: its previous go-to-market model did not require the sophistication of an MWFM solution. However, its new business model needed one. There were numerous basic operations (e.g., initial installation, mandated maintenance visits, meter switchover, and more) that could be supported by app-based workflows to ensure that engineers got things right first time.

Country-specific regulations create country-specific requirements

Elster managed its Italian smart gas meter business for two years without an MWFM solution to support it. But by 2012 it recognized that it could no longer properly support its clients. Elster's Italian business took a while to convince its global management of its requirements. Central management, as one would expect, wanted to find an MWFM solution that could serve the requirements of Elster staff and subcontractors across its European business. However, after a long investigation it decided to advance with a project specific to Italian smart gas metering, as different markets can have very different requirements. Elster manufactures meters for gas, electricity, and water, each of which has specific requirements. In addition, meters are closely regulated, but regulations differ greatly from country to country. The specific requirements of Italian gas metering meant it was impossible to create an MWFM application for all Elster's activities in every country in which it operates. Elster and its partners created an application specific to its needs in Italy; however, the solution may be rolled out to other countries when the need arises.

When it finally gained approval for its investment, Elster moved quickly. It began the vendor selection process in early 2013, signed contracts with Retriever in July, began field testing in December 2013, and gave final acceptance in early 2014.

Retriever's configurability and flexibility helped Elster better manage its smart gas meters

Flexibility was a primary criterion for MWFM product selection

Elster looked at the mobile workforce management apps of a number of different vendors and assessed each on the following criteria, which are given in order of importance:

- the flexibility of the MWFM solution to follow Elster's specific workflow requirements
- the capability to communicate with meters in the field
- speed to market and time to close contract
- cost

- flexibility to manage subcontractors differently than Elster staff.

Elster selected mobile app vendor Retriever Communications for its ability to include data and files outside of the MWFM scope and to manage direct communication with the smart meter, capabilities that its main competitors were lacking.

The mobile app was designed to fit around engineers' workflows

The project focused on developing a mobile app that provided a simple, easy-to-use workflow for Elster's field technicians and subcontractors. The app had to be designed to fit closely with technicians' activities and provide improved management of in-field processes.

An additional but critical element of the project was to embed functionality to communicate with devices in the field. There are certain instances when engineers need to communicate directly with a meter, requiring the integration of MWFM with Elster's back-end systems. For security reasons each meter is fitted with a communication key to prevent hacking. Because field engineers sometimes have to access a meter's communication links, they have to be able to unlock the key. However, to maintain the highest level of security, the field engineers cannot be given direct access to these keys. Instead, an encrypted key is sent through the MWFM app directly to the smart meter via an optical connection. The field worker does not see the key and is not required to input anything into the device.

Elster was also keen to serve information and files to technicians within the MWFM app that are not directly within the bounds of work scheduling and workflow management. These could include maintenance records, user manuals, device management, and more.

Elster uses Retriever for work management and scheduling, and a mobile app for its field workers. The scheduler comes with typical functionality. For example, a Gantt view lists all jobs and to whom they are assigned, and color coding is used to display the status of different jobs. Elster also uses the software to pass work orders on to subcontractors, each of which has its own version of the scheduler. The subcontractor can accept specific jobs and pass these on to individual engineers within its organization. Each subcontractor only sees their own version of the scheduler.

The mobile app will list an engineer's jobs for the day, which the engineer can either accept or reject. The engineer or work scheduler is able to add further jobs to the queue if required.

Retriever's configurability underpins job-specific workflows

Retriever has pushed a lot of configurability into its mobile app. Its ethos is to be configurable for different clients' needs and different roles within these clients. As a result, Elster was able to configure workflows specific to different work types. These workflows are represented as activities on the mobile app, which becomes a checklist for the field engineer. Enterprises can enforce some activities, while others are optional: Elster, for example, forces the engineer to take a photograph of the meter at the start of a job. In addition, an engineer can create new workflows for a specific job, or subroutines added to existing processes.

When a job is finished the mobile app lists all actions done on a job, the parts used, and the time started/completed. Once a job is completed, the app integrates with Elster's back-end systems, from which Elster can perform any number of tasks, such as billing the end customer.

Ease of integration with other systems was a critical success factor

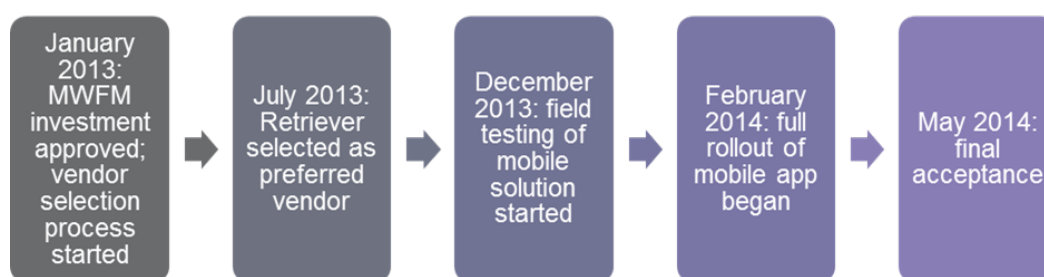
Ease of integration with other applications was a critical criterion for Elster, which runs a custom-built ERP system called CassioPEA and has very specific requirements for its field force. Retriever's

MWFM is one of three different solutions used to support Elster's meter installation and maintenance service in Italy, and Elster was keen to get all three working together as seamlessly as possible.

CassioPEA is an in-house-developed application that collects client requirements for the installation, maintenance, or replacement of smart gas meters. CassioPEA sends work requests to Retriever, which plans the different work activities in the scheduler before it is sent to the field engineer or subcontractor. As mentioned previously, some work activity requires connection with the meter using a connection to an optical port. These include device configuration, reading data direct from the device, and running fault diagnostics.

This communication is managed by a third application called the ISM Tool. Retriever will automatically revert to the ISM Tool to start the connection process. Although the ISM Tool and the Retriever mobile apps are separate – the field engineers move from one application to another – the process was made as seamless as possible. The mobile app launches the ISM tool when required; when the user is finished and closes the ISM tool then they are returned automatically to Retriever. There is also a single sign-on so that there is no logging in and out of different applications.

Figure 1: Implementation timeline



Source: Ovum

Elster's smart gas metering project highlights the requirements of future connected asset management

Elster was very positive about the Retriever implementation. Prior to the rollout it had to manage without any IT support, so its work scheduling and maintenance management has been systematized and is now more efficient. For example:

- The data collected in the field is far more detailed. There are few limits on what data can be collected through the new system. Each job will collect a minimum level, but field engineers are able to add further information if they deem it appropriate.
- Technicians used to spend around 20% of their working days filing reports on completed jobs. This activity is no longer done because the processes are automated.
- After each job, Elster has to file specific documents for its utility clients and the metrological authority. Previously this took days, whereas now the reporting is done within hours of job completion.
- Because the field technician can connect a device to the Elster back office, they can manage problems in real time and recommend potential actions if the engineer is unsure of what to do, resolving more problems at the first attempt.

Elster has also had two years to refine the tool prior to the residential smart gas meter rollout, which is due to begin in 2016. This puts the company in a strong position to demonstrate its ability to manage efficiently fleets of meters for several different gas distributors.

Gas meters are just one type of connected device among thousands that make up the Internet of Things, which promises to transform the way different industries sell their products. Elster's experience in gas metering is similar to the experience of manufacturers serving all manner of industries making the transition from analog to digital and connected products. In the analog world of electromechanical metering, Elster was a box-shifter: it made the product to order, packaged and shipped it, then waited for the next order. However, the added complexity of digitization and connectivity means that Elster's customers are less able and less willing to manage these devices. IoT manufacturers are increasingly becoming "connected asset service providers," where they sell product, but also bundle in services that may include installation, maintenance, inspection, and data management.

Appendix

Methodology

Ovum Enterprise Case Studies leverage in-depth interviews with key enterprise stakeholders as well as a review of any available documentation such as strategic planning, RFP, implementation, and program evaluation documents.

Further reading

Robotic Process Automation: Adding to the Process Transformation Toolkit, IT0022-000511 (October 2015)

The Fundamentals of Enterprise Mobility Management, IT0021-000106 (September 2015)

Business Strategy for Enterprise Mobile App Development, IT0022-000388 (June 2015)

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