



## FIELDNET

### 2005 COMPUTERWORLD HONORS CASE STUDY

#### ENVIRONMENT, ENERGY & AGRICULTURE

NEPTUNE TECHNOLOGY GROUP WORKED WITH A MAJOR US ELECTRIC AND GAS UTILITY TO FACILITATE FULL AT-A-DISTANCE METER READING CAPABILITIES, REROUTING FUNCTIONALITY AND METER-RELATED FIELD SERVICE CAPABILITIES, REDEFINING STANDARDS IN THE METER READING INDUSTRY. [20055321]

*A Search for New Stories*



#### SUMMARY

DB Microware, Inc. a subsidiary of Neptune Technology Group, worked with a major US electric and gas utility to develop a solution that would provide full meter reading capabilities for all utilities and additionally would also provide rerouting functionality and deliver meter-related field service capabilities. The solution redefined the standards in the meter reading industry.

Robert Carrigan,  
Chairman of the Chairmen's Committee

Ron Milton,  
Vice-Chairman of the Chairmen's Committee

Dan Morrow,  
Chief Historian

#### APPLICATION

##### The Challenge

In the past, utilities implemented technology to help drive improved efficiencies in the labor intensive meter reading process. Those initial implementations of electronic meter reading systems utilized some of the leading edge technology of the time. Meter reading vendors introduced the use of rugged handheld field computers in the mid-to-late , at a time when PCs were considered just novel devices. However, as meter reading technology matured, innovation in the handheld based meter reading systems languished as utilities began to see these systems as “necessary evils” that keep the billing process flowing and technology vendors looked to a future world where automatic meter reading (AMR) technologies would render traditional meter reading techniques obsolete. As a result, the state of innovation in a once cutting-edge niche of mobile technology came to a virtual standstill. By the year 2000, when many business people used PDAs, cell phones, laptops and the like, meter reading systems were still DOS-based solutions with serial communications to distributed software platforms. Lack of competition also hindered innovation in this sector and by the late 1990's only a handful of meter reading solution providers existed with one vendor having in excess of 60% market share.

##### The New Paradigm

In the summer of 2000, DB Microware, Inc. decided the time was right for a change in the established model. DB Microware had over 10 years of experience helping utilities manage their meter reading efficiencies with a product called ARCS (Automated Route Control System) and they understood the issues many utilities faced with the now aging meter reading solutions. Working with the assistance of a forward-thinking customer project team, DB Microware set out to redefine what modern technology could do for meter reading and meter-related service work. Over the next two years, DB Microware worked to develop from scratch a system that has changed the meter reading technology landscape. That system required the implementation of technologies never before used in the field meter data collection business. The new system also needed to do more than read meters; the limited nature of a system that just read meters had gotten most utilities to the point that they viewed these systems as necessary evils required to keep the critical ‘cash register’ of the utility ringing. The end result of this mentality was that utilities ran these systems until every ounce of life was extracted from them; the average life span of meter reading systems (hardware and software) often exceeds 8-10 years. This long life span, coupled with the upgrade limitations of the mostly proprietary solutions of the time, generally meant new features or business processes had to wait until the next-generation system was implemented to even be considered. DB Microware realized that this prevailing approach had to change if utilities were going to gain the benefits of modern technology for meter reading and field service. Its solution had to leverage the latest hardware and software capabilities to be more flexible, more adaptable, and had to do more than just read meters. DB Microware initiated a project to deliver a system that would rely on the latest technologies, both hardware and software, and be designed to read meters, provide rerouting functionality, and deliver full meter-related field service capabilities in a single, more adaptable application.

DB Microware had long used Sybase PowerBuilder® for its successful ARCS product, so they first evaluated PowerBuilder’s fit. PowerBuilder’s data-centric capabilities fit very well with the anticipated client needs for field service and meter reading so the continued use of PowerBuilder was an easy choice. DB Microware

selected C++ for the handheld development due to the need for performance and raw speed. That left the most critical component, the middleware, which is necessary to tie the hundreds or thousands of remote devices back to the primary system. DB Microware originally turned to a 3rd party solution that was built on a middleware database construct. This product was later replaced using the iAnywhere middleware solution.

The original project took a little over a year and a half to design and develop. Incredible effort and willingness by all involved to look beyond the accepted standards for meter reading systems of the time were the main contributors to the speed and success of this development effort. When the project was completed, both parties were able to point to numerous business and technical benefits derived from this new system. These benefits included reduced training time, reduced implementation time, reduced support costs, increased efficiency, increased business process flexibility, and improved management capabilities

That system, called FieldNet®, has been implemented at six major investor-owned utilities, reading 8,000,000 accounts per month and managing hundreds of thousands of meter-related work orders each month.

## **BENEFITS**

DB Microware customers have derived numerous benefits from the introduction of the latest technology to their field service processes. First, because the handheld computers are IP-connected directly to the backend system data source, data communications is seamlessly handled at extraordinary speed compared to traditional serial communications methods. This has allowed several utilities to move to same-day billing of their reading, thereby improving cash flow. IP-based handheld connectivity also allows utilities to explore wireless connectivity options as well as remote (home-based) dispatching of personnel. Second, the introduction of Windows CE as the handheld platform has transformed the way meter readers and field service technicians perform their work. Using Windows CE as the handheld operating system allows DB Microware to deliver a solution that can provide English translation of complex utility codes, process sensitive pick lists or wizards to reduce errors and speed field service, touch screen capability to reduce keyboard interaction, audio prompting to improve safety, and full multitasking to interrogate meters in the background while the meter reader or service person is doing another task in the foreground. Third, the multifunctional nature of the system allows ancillary benefits beyond just meter reading, thereby providing enhanced ROI. One handheld connected to one system can provide meter reading, collections processing, meter-related field service, and full meter routing capability. This reduces not only the investment in multiple systems but also IT support, user training, and managerial requirements for the utility. Specifically, the following benefits have been achieved from the DB Microware project:

- ? Fully automated client/handheld system update capabilities, with handheld updates fully automated down to operating system level
- ? Elimination of specialized field computers (other than handhelds), thereby eliminating the need for onsite field office support
- Centralized system (and data) capable of scaling to meet the needs of the largest utilities in the US
- Up to a 80% reduction in deployment times
- Up to a 70% reduction in training time.
- Full exploitation of modern field hardware capabilities, such as touch screen, polyphonic audio, GPS data capture, multithreaded processing, RF communications, and automatic meter reading (AMR)
- Direct IP-based handheld communications that support phone, wired LAN, or wireless communication-based methods without programming changes
- Field data transfer speeds measured in seconds to allow for numerous benefits such as same-day meter read billing.
- Full meter reading routing/rerouting built in to improve route efficiency
- Full ancillary service order capability that allows for integrated meter reading, collections, and meter service work
- Multiple field hardware support capabilities, including handhelds, tablets, and mobile AMR hardware

## **IMPORTANCE**

The introduction of the FieldNet System by DB microware is a lesson in how to break into a monopolistic niche market by anchoring your solution on better technology. FieldNet exploits all of the latest technology to raise the bar on what is expected of meter reading and meter-related field service solutions. It exploits the iAnywhere SQL Anywhere Studio suite to provide unprecedented upload/download performance and reliability. It delivers the first use of a Windows CE based handheld to meter reading and meter service to gain efficiency, increase accuracy, and improve safety in the field. One real world example of this is the use of spoken hazard warnings for field personnel. The handheld tells the user if the next account has "A BAD DOG". FieldNet's design is anchored on a client/server model that exploits industry standard relational

databases to provide a single point solution capable of scaling from the smallest to the largest utilities in the US. And finally, it integrates several common meter-related functions into one environment to reduce support and system management costs.

## **ORIGINALITY**

The project delivered several firsts in the meter reading industry:

- The first commercially available system to use Windows CE for meter reading in the US
- The first commercially available system to use touch screen technology for meter reading
- The first system to integrate meter reading, rerouting, and service order processing into one system
- The first meter reading system to implement direct handheld to backend system communications using pure Ethernet TCP/IP communications
- The first handheld meter reading system to support wireless communications
- The first meter reading and field service system to implement totally automated updating of handheld application software and operating system

## **SUCCESS**

The introduction of FieldNet has driven the entire meter reading software industry to rethink its use of technology. In the two years since the implementation of the first production system, FieldNet has been implemented in six major investor-owned utilities and is now in use reading over eight million meters per month and processing in excess of two hundred thousand service orders per month. The rapid acceptance and implementation of FieldNet by major US utilities caused several other meter reading system providers to re-engineer their product offerings. To that point, the top three meter reading system providers have now introduced or are introducing Windows CE based systems. The FieldNet offering continues to expand, with added capabilities including mobile AMR integration, support for new computer platforms such as tablet computers, and tighter GPS integration.

## **DIFFICULTY**

Meter reading is a mission-critical function of any utility. On each business day, the utility must read between 1/40th to 1/20th of its entire customer base. While 1/20th of anything sounds small, consider that a typical one-million-customer electric utility is reading 50,000 meters every work day of every year. Because of this, utilities cannot have a single day of system unavailability. They simply do not have the manpower to catch up if they miss one day of reading. As a result, any system that provides meter reading, regardless of what else it can do, must perform the meter reading function consistently and without failure. The FieldNet system introduces new technology to almost every aspect of the meter reading process; however, it almost had to be bullet proof from the initial introduction. There were extreme challenges in validating the field hardware, communications middleware, and backend client application. DB Microware was fortunate to find a partner utility company that was willing to take on the risk and challenge of implementing such a radically new and unproven solution. The most unexpected challenges encountered during the project involved the field hardware interface. Because of the high volume of work performed by the average meter reader, even a single extra keystroke or two-second delay in displaying information had an impact on performance. Additionally, finding ways to allow for the exploitation of the windows CE features such as touch screen support and pick lists while still providing traditional “key control” of the handheld functions and processes proved to be most challenging.