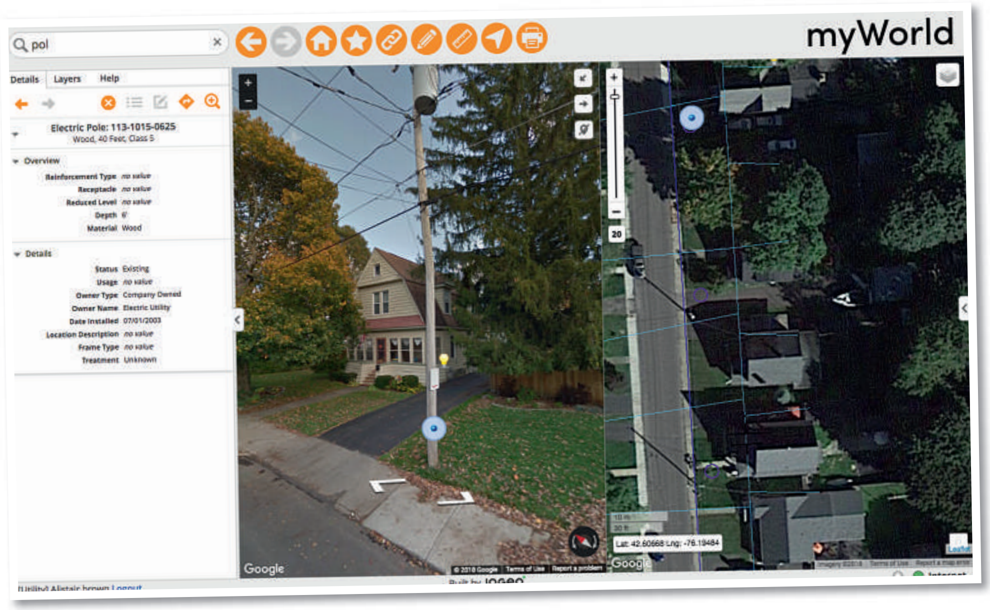
TRADITIONAL GIS HAS FAILED INFRASTRUCTURE COMPANIES

PETER BATTY ARGUES THAT WHILE THE PAST 30 YEARS HAVE DELIVERED TRANSFORMATIONAL CHANGES ACROSS THE GEOSPATIAL MARKET, THERE HAS BEEN VERY LITTLE CHANGE IN GIS, WITH POOR DATA AND SLOW PROCESSES MEANING NETWORK OPERATORS HAVE LITTLE OR NO VISIBILITY OF THEIR NETWORK ASSETS IN REAL TIME, RESULTING IN MASSIVE BUSINESS INEFFICIENCIES AND HUGE OPERATIONAL RISKS



myWorld enables mobile devices to capture network changes when and where work happens, avoiding inefficient update bottlenecks while increasing productivity and collaboration.

After working in the geospatial industry for communications and utility companies for 30+ years, I have come to the rather sad conclusion that traditional GIS has failed these companies.

There has been very little change in this segment of the geospatial market since the 1990s. GE's Smallworld shook up the market in the 1990s with a number of new ideas, and the established vendors Esri and Intergraph (now Hexagon) responded to this by releasing new products in the late 1990s.

Twenty years later and these are still the three main vendors for utility and communication companies. Esri is the only one to develop a new product line (ArcGIS Pro), which is still in the early stages of being rolled out to customers, but it doesn't break any significant new ground. In fact, it looks remarkably similar to Smallworld and Intergraph in the 1990s.

In the meantime, the broader geospatial market has changed dramatically, with the arrival of Google Maps in 2005 completely changing people's expectations about the performance and usability of geospatial applications. The emergence of the market for smartphones and tablets has totally changed what is possible in terms of mobile applications, but traditional GIS products can't leverage these benefits. Completely new applications need to be written to support them and, at the current time, mobile applications from traditional vendors remain very limited compared to their main desktop applications.

Shocking data quality

Data quality in a typical utility or communications company database is dangerously inadequate and processes are far too slow. Almost universally, the time taken to get as-built updates back into the GIS database is measured in months.

One large utility, regarded as having a leading GIS implementation, told us that they typically have 50,000 outstanding jobs in their as-built update queue.

A top communications company said that many updates to their network never actually get back to their GIS, so they always need to go to the field to survey what's there before starting any new construction.

This lack of a timely and accurate view of the company's network assets creates massive business inefficiencies and huge operational risks. This has a very direct impact on time-to-market, maintenance and construction performance, safety, network service quality and customer satisfaction. The current approach to maintaining network asset data has failed.

A key reason for this failure is that existing systems and processes are designed around a cartography-centric approach: creating a representation of the network assets on a single static paper map, in a way that enables operational decisions. This is a difficult task: it requires precise placement of lots of annotation in a legible fashion, often known as "white space management". In many cases this demands complex offset network representations to distinguish between cables or pipes that run along the same path, or very close to one another.

Creating and maintaining these complex maps requires specialist skills, so organisations need to employ a team of GIS technicians or drafters to maintain their maps. All updates must go through this back-office team, creating a critical process bottleneck.

Even when companies have implemented first generation mobile systems, they typically have not moved away from this cartography-centric approach to representing their network data.

A radically different approach

Recent technology developments enable a radically different approach to solving the data maintenance problem. This combines two key elements:

• A mobile-first architecture.

- A reality-centric approach, versus a legacy cartography-centric approach.

A mobile first architecture is an essential foundation for escaping from the complexity of the cartography-centric approach.

There are three elements needed for a successful mobile-first architecture. The first is a common cross-platform architecture so that all functionality, including customisations, is available on all operating systems. The second is for applications to run either online or offline for high availability to address mission-critical operational applications, eliminating the use of paper maps for operations. The third is that the system must be as easy to use as Google Maps, so that applications will be accepted by non-technical users with little or no training.

A mobile-first architecture enables the use of smart applications that understand the network model on every mobile device. This makes it possible to use a much simpler graphical representation of network assets, and instead focus on the reality of how things are connected and where they are located.

You don't need complex mapping annotations when you can just click on the screen to see relevant information or turn on specific dynamic labels that are designed for the task at hand. You don't need complex offset cable diagrams if you can simply ask the system to show you the upstream or downstream devices together with related network information. This reality-centric approach is better for end users of the data, as it results in a less crowded and confusing display than is needed on a paper map. And crucially, it is also key to enabling more and more network updates to be done by end users in the field, when and where work happens.

THESE NEW TECHNOLOGIES ARE CHALLENGING THE DOMINANCE OF 20-30-YEAR-OLD LEGACY SOFTWARE

We are also seeing rapid growth in a range of sensing technologies that enable information about the real world to be captured in a more automated fashion. At one level these include technologies, such as barcode- and RFID-scanning, optical character recognition and GPS, that can be used to record information about equipment in the field. Voice recognition has significant potential to enable field workers to easily record data about the work they are doing. Imagery, video, LiDAR and other sensing technologies enable 'reality capture', which can build models of the real world in a fully automated fashion.

The end of legacy GIS

Infrastructure networks are becoming smarter with real-time demands and expectations. In order to operate modern networks effectively, it is increasingly important to have a timely and highly accurate, up-to-date model of the network. Traditional desktop-based GIS has failed to deliver the data quality that is needed.

A reality-centric approach with a mobile-first architecture, combined with a range of sensing technologies, promises to dramatically improve the ability of infrastructure companies to keep their network data up to date. These new technologies are challenging the dominance of 20-30-year-old legacy software and I expect that the next few years will see the most significant change in the geospatial software market for infrastructure companies since the 1990s.

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