

BIOGRAPHICAL INFORMATION

Don Breitweiser
Director, Client Services
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Specific Responsibilities

Joined MapFrame in 2002. Responsible for MapFrame's project management organization and project deliveries.

Past Experience

Prior to MapFrame, Don worked 7 years with Utility Partners, a major provider of Computer Aided Dispatching (CAD) systems to utilities. With Utility Partners Don worked in Sales, Account Management, and Project Delivery roles.

Prior to Utility Partners, Don worked as a consultant with GTE (now Verizon) for approximately 1 year.

Prior to the consulting role, Don worked for JCPenney Co for 22 years, the last 7 years in JCPenney's corporate headquarters in Dallas Texas. There he was responsible for technology evaluation and hardware platform selection for the company.

Educational Information

Attended - University of Wisconsin, Milwaukee

**How to Leverage your GIS Investment
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The acceptance, and therefore the growth, of GIS technology in the utility market space in the last 5-7 years has been tremendous. I'll define "utility" today rather loosely to describe Power and communication providers; electric, gas, water, telecom, and cable. GIS has grown up in the eyes of IT and corporate executives from an "engineering tool" to be an equal to CIS-Customer Information Systems, Outage Management systems, and Work management systems. In fact, the spatial data stored in GIS is rapidly becoming a critical link to those systems data.

As this happens and the eyes of the corporation (and customer and commissions) turn toward this source of data the demands have become greater on the GIS systems and the GIS system's themselves have become "greater". So has the cost of implementing and maintaining the GIS.

To this end, companies are rapidly looking to ways to mine use, users, and value from this data source. Just as Computer Aided Dispatch systems (the other CAD system) extend the CIS system into the hands of field workers, mobile GIS systems today are taking the value of the GIS data store and putting it into the hands of the field workers, the ones who are locating, digging, repairing.. working with the "REAL OBJECTS" every day.

This presentation contains some ideas, some case studies, and some "lessons learned" about how "ENTERPRISING" the GIS system is providing the ROI that has long evaded most GIS implementations. My boss often starts a presentation to utility management like this:

" GIS, as you probably know, actually stands for Geospatial Information System, but to many Utility Executives GIS is an acronym for "Where did my 20 million dollars go?""

This perception is changing as GIS takes a more mainstream role. Now they know where the money went and why. Today we will look today at a strategy, implemented in

differing ways, employed successfully by many US utilities today to return that investment to the company, the shareholders, and the ratepayers.

My name is Don Breitweiser. I am Director of Client Services at MapFrame Corporation, headquartered in Dallas Texas. MapFrame's product suite is based upon the simple concept of a field friendly GIS platform.

The foundation of mobile GIS follows much the same historical pattern as does the extension of Customer Information System (CIS) data to the field via Automated Dispatch systems to hand customer contact (turn of, turn off, etc) orders, or Work Management data and printed work orders evolving to Field Work Management tools.

There 2 undeniable reasons utilities moved to these technologies. First, while the CIS or WMS system was in the office or computer room, the work and the customer is not. The support systems are not where the work is performed. Second, these field automation systems allowed for the merging of data from other sources to be combined in the field "presentation", enhancing the productivity of the crew or the customer's perception of the utilities commitment to customer service.

It is no different today with mobile GIS initiatives. The First driver of this technology is the value of the GIS raw data to the field worker. That list alone is meaningful and impressive. Consider:

- Outage scenarios where the field worker has not only the facility map/schematic but also has the current attributes about size, status, age, and connectivity.
- Storm or disaster scenarios where distributed or foreign workers can reference the facility maps and attributes, even in extreme situations where the facilities themselves are no longer there.
- Locate and "one call" processes, that can speed the work and enhance the accuracy of underground locating.
- Short duration high volume work where land base maps with road attribution, routing, and driving directions can skew the work day bias away from windshield time toward productive work time.
- Redline or markup capabilities to communicate corrections to GIS maps based upon actual field observation.
- Safety of crews, safety of facilities, and safety of your maps. An online map that can be password protected or "locked" is far more safe from "evil doers" than a rolled up set of paper maps in the crew vehicle.

We could spend the remainder of our time brainstorming the benefits of getting GIS out to where the work is done. But we won't.... Our second reason for field automating GIS is the ability to merge data from other systems or places, and boy does mobileGIS make this case a strong one. We are all here because we believe in the value of spatial

data and its ability to connect and communicate with us. In the field this linkage of data to GIS spatial representations is peerless. Some examples are:

- Associate customer data with the meters, transformers, and service pipes.
- Associate outage data patterns from an OMS system to grid areas, circuits or mains, or addresses to see the spatial distribution of outage reports and the facility hierarchical relationships.
- Include transportation data in the land base to facilitate least time/distance routing between points or throughout a scheduled route
- Associate documents (schematics, drawings, etc) with facility objects so lookup is spatial and useful.
- Associate forms for inspections of objects, spatially located and automatically configured to that specific inspection.
- Display work orders spatially for route planning and a map based view of a days work assignments. Also associates the work order to facilities in proximity to that order.

These are ways mobile GIS technology can benefit users in the field, but first let's take a minute to look at the scope of a mobile GIS solution and then explore how it might actually return ROI with a few case studies.

Many large organizations have large field workforces - although not as large as they used to be.

Today we see

- Fewer people with more work
- Increased safety and security standards
- Higher expectations for customer service

....All to be achieved with a smaller budget.

For many of these organizations, most work is spatial in nature:

- Where am I ?
- Where do I need to be ?
- Where are my facilities ?
- Where are my customers ?

Driving Forces:

- Paper maps are costly and have limited usefulness ...
- Enterprise-level GIS technology has evolved ...
- But has problems extending to the field:
 - Data volume

- Updates
- Platforms
- Complexity

Mobile Mapping is Based on Several Enabling Technologies:

- Field Hardware
- Wireless Communications
- GIS
- GPS

WHERE IS ROI ? FIELD SERVICE

- **Situation:** Fewer crews, more work.
- **Status:** Need for major advances in productivity and customer service.
- **Solution:** Maps and customer data linked to service orders or Work orders

WHERE IS ROI ? DAMAGE PREVENTION

- **Situation:** Street construction.
- **Status:** Prevent accidents by locating and marking existing facilities.
- **Solution:** Accurate, timely, accessible maps and data updates.

WHERE IS ROI ? DAMAGE ASSESSMENT

- **Situation:** Major storm outages. We've seen plenty of these in 2004 to take this seriously.. over \$ 1 billion in utility damage repair costs in Florida alone in 2004
(notes \$650m FPL, \$350m PE, \$45m SoCo, \$60m Teco, ..)
- **Status:** Multiple crews, unfamiliar with territory. Across state, or across country, or from behind a desk

- **Solution:** A spatial framework for all tasks (damage assessment, record keeping, work planning). Fast and organized. Combine outage reports, with facility and road maps and add special customer requirements too.

WHERE IS ROI ? Inspections, audits, Joint Use?

- **Situation:** Periodic inspect of facilities for regulatory compliance and revenue
- **Status:** Multiple forms, repeated data entry, missing validations.
- **Solution:** Inspection application built on map data. mobileGIS not only shows features but contains attribution to KNOW about date of previous inspections, earlier inspection notes, and approved attachments. Forms are unique to structure being inspected and are prepopulated with attribute data to speed job performance. E

WHERE IS ROI ? Vegetation Management

- **Situation:** Expensive and continuing job. Required to maintain reliability and resiliency to storms but rejected by many customers.
- **Status:** Paper work, spotty work, heavy reliance on contractors, and exposure to customer complaints and suits..
- **Solution:** Vegetation management application built on map data. mobileGIS can track progress on circuits, supports forms and drawing tools to record work performed, and association with customer data and past customer contacts lets field workers manage notice situations, chemical application situations, etc..

These applications have all focused on getting data... map data, customer data, order data, whatever, out of the office and into the hands of the field worker. To reiterate a point, the value of the spatial field Map presentation is that it puts that data into a format, a map format, that field workers are used to, recognize instantly, and intuitively understand. Enterprising GIS; changing that paradigm from a Legacy or Enterprise GIS system locked up in a safe room in your HQ to a tool that is accessible and available to your field forces (as well as casual office users don't forget) is what we've been talking about. There are a few key attributes that you need to consider when considering field mapping solutions and when preparing your infrastructure for this evolution...

Enterprising THAT ROI!

A technology investment can maximize return only if it can reach the entire enterprise.

I submit, the keys to achieving ROI in field computing is building applications that are:

- Fieldcentric
- Mapcentric
- Task-oriented
- Connected

Fieldcentric is not surprise as it's the core technology espoused in this presentation. **Mapcentric**, also no surprise, but enabled by the investment in GIS that drives this whole message. **Task oriented**, I think this represents the merging of the technologies and data sources we've been discussing. Not maps for maps sake, but maps merged with supplementary data to create tools, task oriented field valuable tools. A hammer has a purpose, as does a screwdriver, and a wrench. With the exception of the wrench which is sometimes misused as a hammer nothing else is used to perform that special purpose. Not too many linemen will pull out a nail file to tighten a screw. Data that informs and equips a field worker to do his/her job better, faster, safer, and more accurately IS an accepted and appreciated tool. **Connected**, I hesitate to use this work because it implies constantly connected. I DO NOT mean that. Real world experience says that full time wide area connectivity cannot always be relied upon, and when conditions are worst is when you need your data most.. storm restoration, major outages, etc. What I mean is connections to ensure field data is current and accurate before the work is performed and connections that move field collected data (redlines, inspections, notices, repairs, map corrections, etc) back up to the office and to the appropriate persons or organizations with out redundant, costly, and time consuming re-handling of that data as would be required with paper forms, paper drawings, etc..

Real ROI examples

A large western gas company who is at the forefront of mobile computing and mobile GIS technologies, has implemented an integrated system of mobile maps with WMS and CAD. This utility attributes the benefits of field computing directly to their success in doing more with less. Their primary measure is a ration of employees to customers. In recent years the cost of technology platforms has decreased significantly, while the average labor cost has increased significantly. Disk storage which was over \$135,000 per gigabyte in 1988 now is something less than \$30/gigabyte. While steadily adding new customer, this utility is in a fast growth area in the south west, they have managed to hold their employee count near level . In 1991 this utility had 1 employee for approximately

every 400 customers. They now have 1 employee for every 600 customers. A 50% improvement in this measured ratio.

A large south eastern electric company, with more than 1000 trucks in the field estimated the payback of field automation on broad range of criteria, but one that stood out was the simplest. If efficient scheduling of field work via mobile WMS and mobile CAD and efficient street level routing , via mobile GIS could save minutes per day for each vehicle, the savings would be tremendous. Their target was not to just theoretically record minutes saved, but to increase the number of work orders performed daily to increase efficiency and ultimately, just as the case above, improve the employee to customer ratio. A great many factors go into measuring this in your organization and in departments of your organization. Crews of 2 with expensive equipment or meter readers with minimal overhead beside themselves. But if the customer was to save only 10 minutes per day per vehicle, at a rough savings of \$1.50 per minute per vehicle, the daily the theoretical savings would be \$15,000 per day. If 30 minutes were saved, \$45,000 per day, or \$990,000 per month. As we said, the real benefit comes when the 11 hours saved per vehicle per month are used to service more work and more customers without additional cost to the utility.

In summary, there is tremendous “spatial” acceptance by field users and exceptional value to be gained when the GIS investment is put into field workers hands. Imagine 500 or 1000 daily users of your GIS data rather than 20 GIS “engineers” in the office. Consider making more productive use of your GIS data getting field input to maintain currency of that data. Add to that the spatial orientation that lets other field work systems interface in a way that is intuitive and natural to the field workers themselves. Plan for each of those field workers to work and travel more efficiently and more productively. This vision is shared b dozens of forward thinking utilities in the US today who have implemented mobile Mapping systems and are in some stage of integrating the maps with their other field enabled system. Do this for 2-5% of the cost of your existing GIS investment and to me and those utilities that have shared this vision you have a clear, valuable, and justifiable business case for field mapping.