Title

Taking Tablet PCs and the Enterprise Geodatabase to the Field

Abstract

Learn how Burbank Water and Power has drastically expanded its GIS implementation by supporting field operations with mobile GIS on Tablet PCs updated on a wireless LAN. Listen to a case study and view a live demonstration of Burbank's deployment of the geodatabase in the field. Gain great insight on how Burbank's electric utility employs Tadpole-Cartesia's GO! Sync product. GO! Sync synchronization software, built around ESRI ArcObjects, is used to securely and reliably synchronize the incremental changes tracked in ArcGIS with the personal geodatabases used in the field. Understand Burbank's utilization of ESRI products from ArcSDE and ArcInfo to ArcReader. See what advantages the Tablet PC can offer to the field. Be intrigued by the redlining and gesturing inherent to the Windows XP Tablet PC operating system. Obtain the necessary information and links to ESRI's Tablet PC Tools to help you obtain accurate, paperless, geospatial information in the field.

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Paper

Spatial data has been going to the field in the utility industry for some time now. The medium has been paper book maps, paper feeder schematics, paper pressure zones, and essentially, paper everything. The typical routine is that a field worker gets a map or a set of maps on a standard interval (weekly, monthly, bi-annual), places his/her job notes, redlines, or "as-builts" amongst the coffee spills and doughnut grease, then returns them back to the office for update to the master dataset. New paper copies are then produced and the vicious cycle continues. Some people would call this part "job security."

With today's advances in technology, the computer has been designed smaller, lighter and more rugged. The Tablet PC is one good example of technology advancement. A Tablet PC is no larger than a laptop computer but differs in that it uses an active pen and touchscreen instead of a mouse and keyboard. This allows the field worker to write on a digital map the same as he/she would on paper.

The Windows XP Tablet PC Edition of Microsoft's operating system combined with ESRI's free Tablet toolbar enables you to render ink graphics on top of your ArcMap documents. Some of the standard Tablet tools include a pen, highlighter, eraser, and a convert to text recognizer. The ink graphics can then be geographically tied as an annotation layer to an enterprise geodatabase.

[Tablet PC Support for ArcGIS](#)

Burbank Water and Power (BWP) currently has six Tablet PCs deployed to the field construction supervisors. Last year we implemented a view only map of the electric distribution system that allowed BWP to remove some of the paper maps from the field. The field supervisors were due for upgraded PCs, so the added cost of the Tablet PC was minimal on the budget. The ESRI software used for the deployment was ArcReader, (no cost) which allows the users to basically maneuver, find, identify and print from a map. The real ROI did not come from the savings in paper and printer consumables. Instead it came from the removal of the labor to print, collate, and distribute mapsets.

Enter Tadpole-Cartesia's GO! Sync™ View, which allowed BWP to remove the labor from the paper reproduction process. GO! Sync synchronizes a disconnected personal geodatabase on the Tablet PC in the field with the enterprise SDE geodatabase in the office. The removal of the labor was not the extent of the value added. The true value came from the daily updates to the field crew's map data. All edits that were posted from the office were available the next morning for the field supervisor to receive through the wired or wireless network. It was also a relief to our network bandwidth that the GO! Sync product would only have to send the changes to the geodatabase instead of trying to copy the entire .mdb file.

The next step was to enable the field crew to communicate back to the enterprise GIS via digital ink. Direct editing to the GIS was removed from consideration due to the job descriptions and relations with the different labor Unions involved. The paper methods used were to be maintained in a digital manner.

Field ◄► Engineering
> Report concerns on designs or current conditions.
> Show as-builts for engineering review.
> Report incidents with contract crews.
> Show repairs or temporary solutions made after hours or on trouble calls.

Field ◄► Mapping
> Notification of errors in the GIS data – QA
> Show as-builts for updates to the GIS.
> Show repairs or temporary solutions made after hours or on trouble calls.
> Field check of a facility record.

Field ◄► Field
> Notify other crews of hazardous conditions.
> Notify other crews of disgruntled customers.
> Show temporary solutions made after hours or on trouble calls.
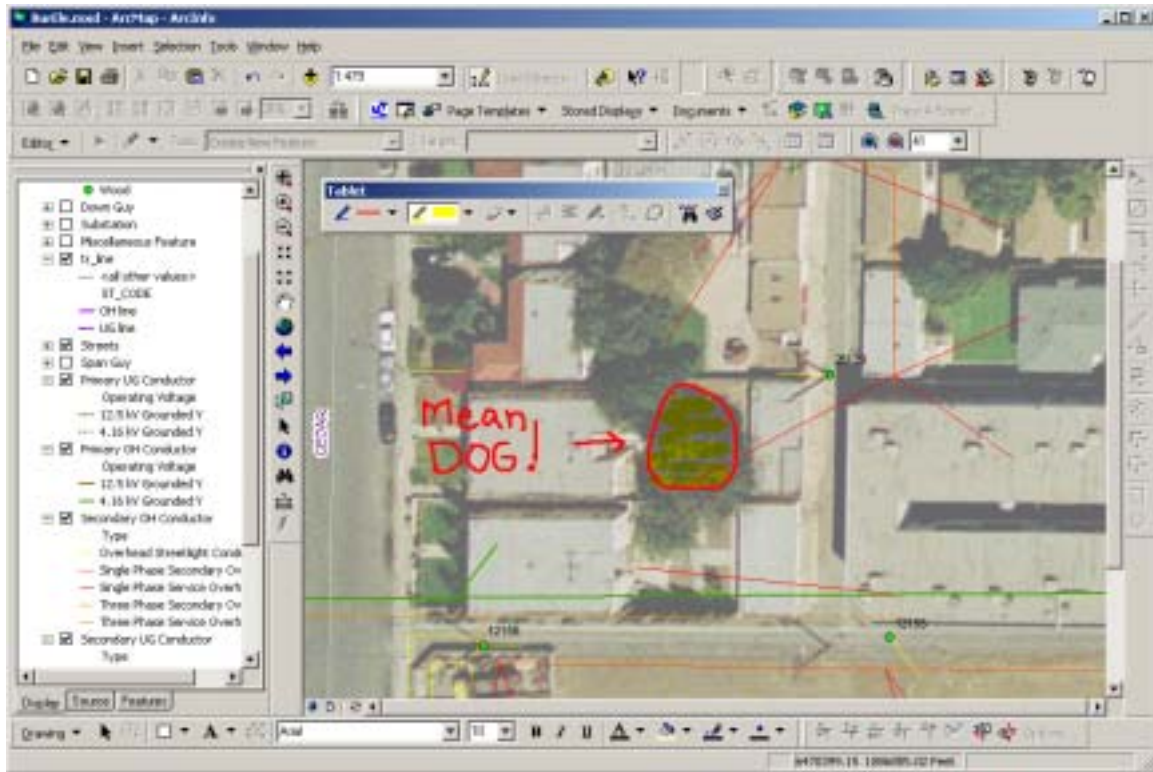
In order to facilitate the digital ink editing in the field, an ArcGIS license was required. An ArcView license will allow an ArcMap user to edit a personal geodatabase in the field. By equipping three new ruggedized Tablet PCs with ArcView, BWP gained the added value of the ability to use the query and trace routines specific to electric facilities in Miner & Miners® ArcFM™. In addition, the "Stored Displays" available in ArcFM made job specific symbolization and labeling available in a single ArcMap document. Another added value is that ArcMap is customizable, where as, ArcReader is not. One such customization available to the Tablet PC is called "gesturing." Gesturing is the ability to make movements with your pen that interact with navigating or other common tasks in the map. Interact with your Tablet PC

Enter Tadpole-Cartesia's GO! Sync! Redline, a custom editing and synchronization toolbar within ArcMap. GO! Sync Redline facilitates the automated transfer of the digital ink, be it, enterprise to peer, peer to enterprise, or peer to peer. BWP has further eased the ability to transfer the digital ink updates across the organization by installing 802.11 wireless devices in the electric substation using the existing fiber optic network infrastructure. The standard 802.11 network devices built-in to the Tablet PC's will allow the field supervisors to obtain a network connection to receive email and updates to their personal geodatabases within 300 feet of any electric substation.

The key to success has been in the simplification of data management. In scenarios such as the field solutions at BWP, versioning can get out of control. To maintain control and process, BWP utilizes the "Session Manager" within Miner & Miner's ArcFM. Session Manager has some predefined process framework that allows BWP to view status and

ownership on all versions whether made for in-house editing, GO! Sync Redline, or even exports to outside contractors for field inspection purposes.

How you get your data to the field is one thing. Utilizing Tablet PCs is another. Consider what digital ink, gesturing, script to text, and speech recognition can do for the highest level of mobility and productivity in a single hardware/operating system solution to date.

In conclusion, paper intensive field operations can now be streamlined by utilizing the Tablet PC tools, ESRI's ArcGIS, and its business partner solutions

References
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