



By Stephen C. Blaskey, PS

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Myth #2: Building a GIS System Takes Too Long

The myth that it would take too long to build and implement a GIS system for the Surveying Business to see any real benefit is based

mainly in the idea that the Surveying Business must change the way the business is handled to fit with the GIS. Every Surveying business is managed in a different way, which provides a problem for the existing GIS industry; so they try to develop a “magic bullet” that handles all of the needs of every Surveying Business. Trying to provide a pre-built solution and expect the entire Surveying Industry to fall into rank has caused backlash and resistance to the implementation of GIS.

The way to overcome this problem is to make the GIS work the way that the individual Surveying Company does business, and use the GIS to automate and simplify tasks that are already being done in the course of normal business. Building a GIS in this way provides two distinct advantages: First, you as the designer of the system have intimate knowledge of how the system is working, and second, you will have less time involved in training others to use the system.

The first thing to do in the creation of a GIS system is a careful analysis of the step-by-step process in which a job is ordered, completed, delivered and paid for as the project makes its way through your business. Every piece of information collected or created at each step of the order process will be important to document, as well as, who provides the information, what format the information is in, and what is done with that piece of information.



Sally taking a job order over the phone and writing the project information on a Job Order Form

Each step in the process as it occurs in your company will give you clues as to how to most effectively build your GIS system. Be mindful of each intricate step in the process, as proper planning at this stage of this process will make your finished system a better fit to your needs.

Example: *The phone rings at Bob’s Surveying Company. Sally answers the phone and it is a client requesting survey to be done. Sally gathers the following information: Client Name, Billing Address, Phone Number, Job Address, Type of Job, and Date of Order. Sally then writes all of this information down on a job order form and assigns it a Job Number. This form is then given to Bob who looks up the legal description of this Job Order and writes it on the same form.*

The above example has given the designer of the GIS System all of the information necessary to start the first table in the database component of the GIS system, as well as, a clue as to what the second table of the database needs to be, and what the first form for the database will look like. The first table to be created will contain all of the information regarding an individual Job Order, which could be called simply “JOB_ORDERS” (some database programs do not like the use of spaces, so avoiding them will make your life easier down the road), which shall contain the following fields: JOB_NUMBER, CLIENT_NAME, BILLING_ADDRESS, PHONE_NUMBER, JOB_ADDRESS, JOB_TYPE, DATE_ORDERED, and LEGAL_DESCRIPTION. Some of

these fields can be broken down further, and I definitely suggest doing that, such as City, State, And ZIP Codes for the addresses, or Subdivision, Blocks and Lots for the Legal Descriptions.

The clue to what the second table could be is in the JOB_TYPE field, we can either type in "Residential Survey" into the field every time one is ordered, or we can create a table that has a list of most types of jobs completed by Bob's Surveying Company (we can never have a complete list, but we can either add to the list as we go, or have a OTHER type of job). Since the job of the GIS is to speed things up, every place we can eliminate redundant data entry that can be done should be taken advantage of.

The first form for the database could be a database rendered version of the form Sally filled out in the example. Making the form for the database look just like the paper form that Sally is already used to using will minimize the time to teach Sally

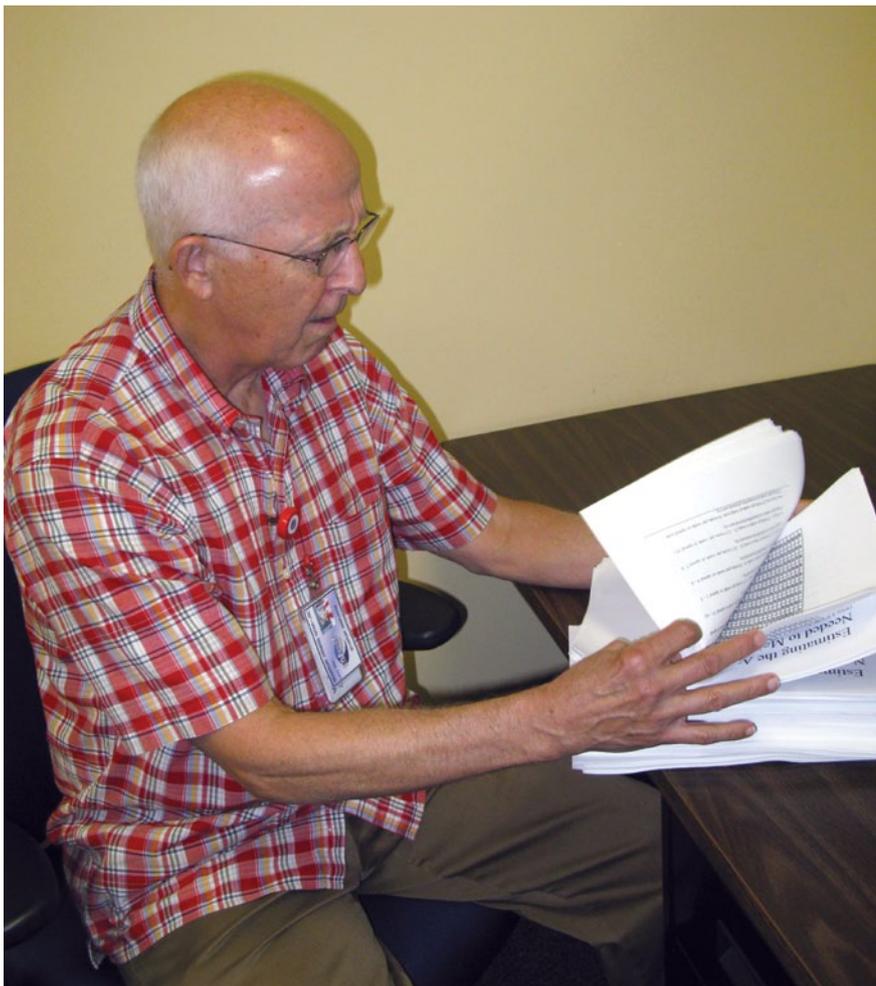
to use the form, instead of writing it with a pen, she merely types it in the same place on the digital form.

Example Continued: Bob then gives the completed Job Order form to Mike, the Party Chief who will conduct the survey, who goes out and completes the survey. Mike then gives the Job Order form, the field notes, and the point data to Bob who then verifies the field work is completed for this survey. Bob then writes the date the field work was com-

pleted on the Job Order form, and then gives everything to Maria who will be doing the drafting for this survey. Maria completes the drafting and takes Bob the finished survey, as well as, the Job Order form. Bob verifies that the survey is correct, who then signs the survey and writes the date that drafting was completed on the Job Order form.

This portion of the example has shown the need for a new table in the database system, "JOB_STATUS." This

"...the magic of creating the system in this manner is in how did the implementation of the database alter the way Bob's Surveying handles its business?"



Bob shuffling through a stack of Job Order Forms trying to put together a list of projects that need Field Work done.

table will include the following fields: JOB_NUMBER, FIELD_COMPLETE, and DRAFTING_COMPLETE. The place to enter this information into the database can be added to the form already created, in the same place where it was on the paper form created earlier. Now instead of writing the information on the paper copy as Bob has been doing he simply types that date into the database.

Notice that JOB_NUMBER is in both the JOB_ORDERS and JOB_STATUS fields, this is important to be able to create a relationship between the two tables, allowing them to work together. The power to create these relationships is where the database will start to provide advantages almost immediately. Sally now has the ability to immediately see if the field work has been completed on a particular job order, without having to try and track down Bob or Mike to ask them directly, and can inform the client if they call and ask.

We also now have the ability to create our first two reports to get usable data out of this system, Field Work Needed, and Drafting Needed. Since all of the data is housed in the database, we do not need to shuffle through a stack of Job Order forms to figure out which projects need field work or drafting, we can simply query the database to show all jobs that do not have a date in the FIELD_COMPLETE or the DRAFTING_COMPLETE field and view a list immediately.

Example Continued: Bob then takes the signed copies of the survey and the Job Order form to Sally who then types out an invoice for the job, writes the invoice date and amount on the job order form, and contacts the client. The client comes in to the office picks up the survey and pays for the work. Sally then marks on the Job Order form the date the work was paid for and files the Job Order form to its final resting place.

We are now shown the need for some additional fields in our JOB_STATUS table: INVOICE_DATE, INVOICE_AMOUNT, and PAID_DATE. These new fields can be added to our existing form so entering them into the database can be made as seamless as everything else we have done. The addition of these fields to the database will allow for the creation of a number of different reports not limited to Accounts Receivable, Revenue, or a report detailing how long each client takes to pay for a job.

In addition, the steps that Sally has to take to create an invoice can be reduced, since some of the information needed to create the invoice in the example has already been entered into the database, there is no need to retype it, simply making the invoice a form in the database will allow you to populate some of the blanks in the invoice with data from the database, for example, the billing address, job type, invoice date, invoice amount, legal description and job number.

Now in your hands is a robust database system that can handle all of your job creation, job tracking and invoicing tasks. This system also allows you to create a number of reports on the fly, putting information about every job at your fingertips.

But the magic of creating the system in this manner is in how did the implementation of this database alter the way the Bob's Surveying handles its business? The only change in the day to day operation was instead of writing with a pen on a piece of paper the aspects of a project, we are simply typing the same information into a form that on a screen looks exactly like the paper form that has been used.

Remember that this database is only the first third of a fully functioning GIS system, but already powerful enough to be used on its own and with diligence can be built in a day. Next we will look at building the Mapping Engine and Linkage, which will give us a way to visualize all of this information and more on a map, and the full power of the GIS system can be realized. 



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