



By Stephen C. Blaskey, PS

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Myth #1: GIS Cost Too Much Money to Get Into

Before dispelling this myth, we need to have a discussion of what makes up a robust GIS system. There are three parts: a database, a mapping engine, and finally a linkage. Each of these three parts is vital to making a GIS a viable solution for the needs of a land surveying business. And while the database and the mapping engine each have advantages to implementation, there is no magic until the linkage is brought to bear.

The Database System

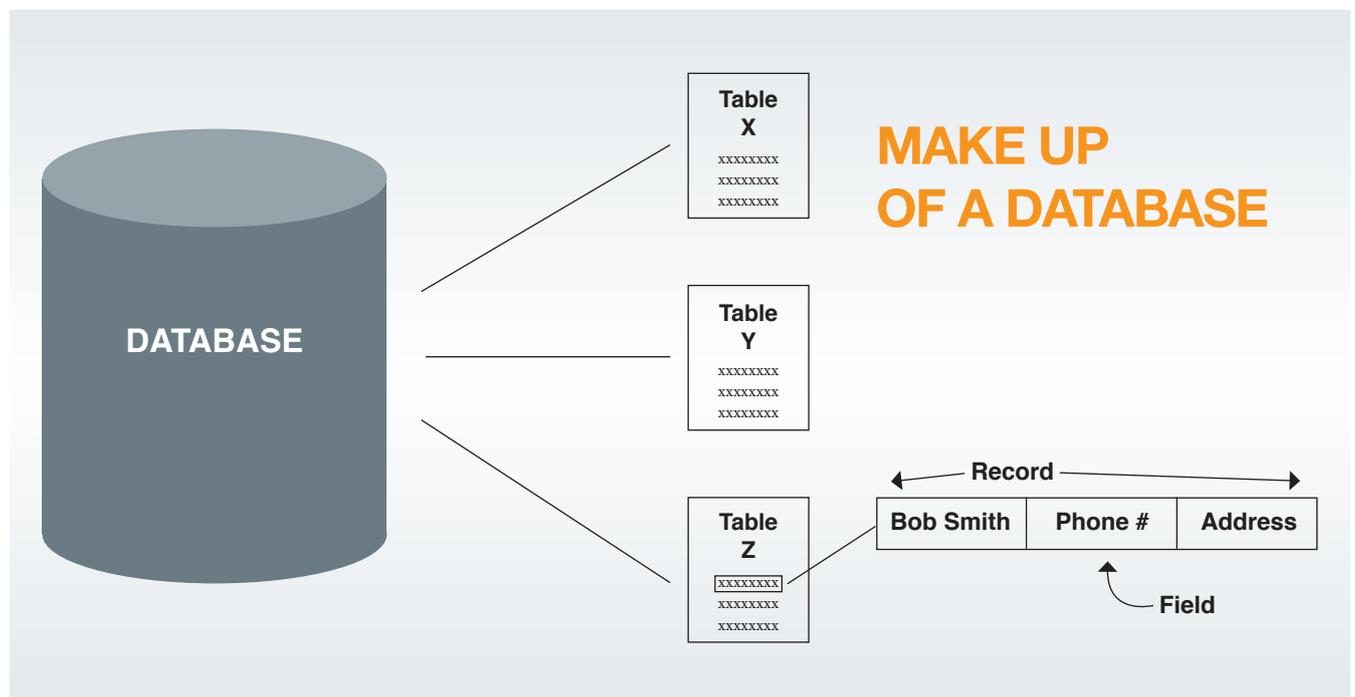
First, a database is a collection of tables that all relate to each other by a defined

relationship. Each table in a database is set up with rules on how each data entry (or record) is defined. An analogy of a database table is a spreadsheet, where each column is a data type, and each row is a record of data. Thinking of a database as a collection of related spreadsheets will also help with the design of the database. A database is composed of tables, a table is composed of records, and a record is composed of fields.

For example, let's say we have a database called "Bob's Surveying Company," and within this database is a table called "Jobs," within this table is a record for Job Number "12-0002", and a field within this record is the "Client's Billing Address." All other pertinent information

for this Job Number would be located in this same record: What type of work is being performed, how much money will be billed, payment status, where is the project located, etc.

Having a database such as the one described can provide advantages all on its own, as the database can be asked questions about the data within it: this is called creating reports. Questions like the following can all be answered by the database quickly and accurately: How much sales tax did I collect in January of 2012? Does George Construction owe me any money? Which of my current projects need drafting? In fact, because the first task for my GIS system was job



tracking, the database system was the first thing I implemented in developing my GIS system.

The Mapping Engine

The Mapping Engine is simply a way to display data on a map. It will provide the framework to deal with points, lines, areas, and raster images on a map. It will also be able to resolve different coordinate systems to be able to overlay all of these different data types on a map. A more advanced mapping engine will also allow the user to perform queries based on the geographic components of a dataset.

One of the largest mistakes of a new firm on its journey to start up a GIS system is that too much importance is paid to the selection of a Mapping Engine; this is akin to buying a house based solely on what the windows look like. Selection of an appropriate Mapping Engine is an important decision to make at the beginning of a GIS system development, but do not feel that once it has been decided upon that you are stuck with it. I am on my third Mapping Engine.

The Linkage

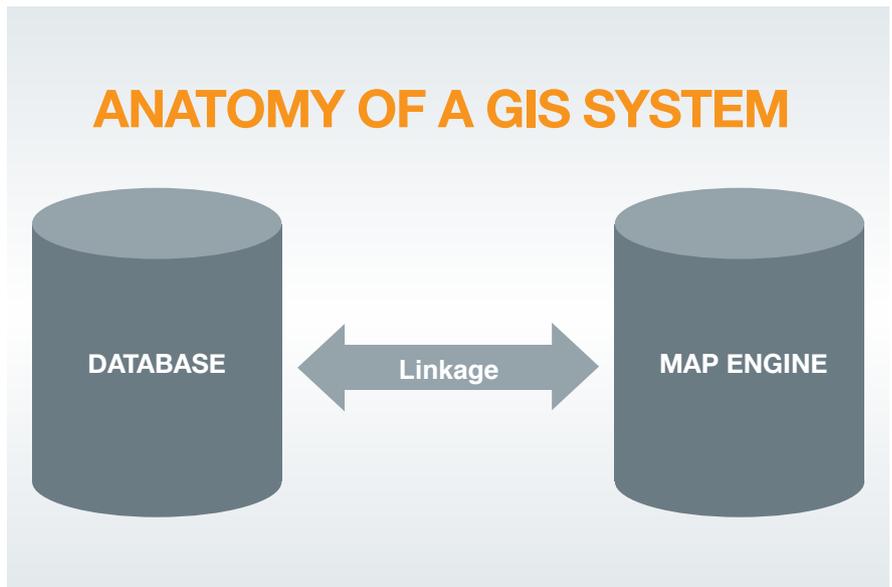
The linkage is the path that data from the database can be related to the Mapping Engine. Without this you have 2 separate systems that cannot intermingle. Usually a linkage is created through one of the many ways to georeference the data in the database, which will be discussed in a later column...

Think of the GIS System as a working restaurant, with the Kitchen being the Database, the Mapping Engine being the plate in front of you, and the Waiter being the Linkage. Without all three, you do not get a meal.

Questions To Ask Yourself

The first thing to do in selecting appropriate software packages for your GIS System is to look at what you already have. Did your new computer come with a copy of Microsoft Access? Are you already using the Open Office Suite, or some other sort of off the shelf software with a built in database program?

The second question to ask is, What are the capabilities of your current staff? Did you or one of your technicians take a class in databases in high school or college? The more knowledge you already have in house the less time it will take to get a system implemented and see a full return of investment.



Next you need to ask what level of comfort you have with different mapping engines. Have you taken a class or two on ArcGIS, or Autodesk Map? Any of these skill sets can be transferred to building the GIS System.

How many people will need to access the system simultaneously, will it be on a network, are all users at the same location? The implementation of the GIS System for multiple users will differ from the implementation of a single user set up.

What do you need from your GIS System? A thorough and honest evaluation of what you expect to get out of a GIS system will be invaluable at this stage in the process. You do not need to buy a Ferrari if all you plan to do is go to the grocery store once a week.

Finally, how much money do you want to invest in building a GIS System? If all you need is a basic system to begin with, there is no need to spend large amounts of money to buy the latest and greatest Mapping Engine software, when the free stuff on the Internet will work just fine.

A Way to Get Started

I am not trying to avoid telling you the exact best course of action for each situation, but rather that it will depend on your individual needs. What I will do instead is show an inexpensive alternative which can be customized to fit your needs.

First, you will need a computer with a sole purpose of being the GIS machine. It does not necessarily need to be the biggest and baddest machine in existence, but it will need lots of hard

drive space. Between aerial photography, parcel information, and PDF images, GIS data is large by its nature, and you will want to have lots of space to grow into. I would not consider anything with a hard drive of less than 1 Terabyte. Hard drives are inexpensive, so this will not add much to your costs.

Second, we need to select a database program. If you are not already using a database then pick one that will be easy to learn and get support with, I suggest Microsoft Access. This program has been around for enough time that the major bugs have already been worked out, and there already exist extensive online help programs, and many books on the subject. This program can be obtained for around \$100, and can be picked up anywhere.

Finally we need a mapping engine, my suggestion is that you start bare bones and then figure out if you need anything more robust. Quantum GIS is free to download and use, and maintains a big portion of the functionality of the more expensive database engines. It also has a downloadable User's Guide which will help in getting the system up and running. Granted, it is not the best answer for a Mapping Engine, but by using it all of the concepts you learn can be applied to a more robust Mapping Engine, if you need to upgrade later.

So for less than a couple of thousand dollars you would now have all of the tools necessary to build your own GIS System. All that is left is the hard part, actually building it, which we will start discussing in the next column...