



The New Face of Training

The need for improved training to bring more people up to professional standards is being met using internet technology. Steve Soloman of Sological Solutions, shows how an innovative training regime can bring greatly improved results.

In the world of computer software, GIS has always held a somewhat iconic status. Aloof from the daily drudgery of word processing or number crunching spreadsheets, its ability to combine database information with spatial features that represent the real World has always given GIS a sheen of almost magical power (“ooh, can it show me my house?”) that brought with it a sense of unapproachability. If it shows something that “looks” complicated, then it must have been complicated to show it.

Too simple, too complex or just another piece of software?

Certainly, there is a grain of truth in the argument for complexity; data standards that cover anything from what constitutes an address through to the correct referencing of a cadastral parcel don't write themselves, you know. And the World being a three-dimensional place can be very inconsiderate when we mostly use 2-dimensional maps, which means that any compilation of a map in GIS has to first address the meaty issue of coordinate systems with inelegant and rather unintuitive names that gall, such as WGS, NAD and Sinusoidal. To the uninitiated, these simply add to the sheen of unapproachability that appears to cloak GIS in the corners of council offices and private organisations world-wide. This sheen will only deepen as GIS vendors add third and fourth dimensions to their software's arsenal of functionality.

On many occasions, more than you might anticipate, this “sheen” gets an occasional polish from experienced users looking to protect their own corner of a foreign field that will forever bewilder those looking on. This attitude, whether intentional or a by-product of time constraints, prevents the trickle-down of knowledge on which many organisations rely, as if spatial analysis skills will reach the mapping echelons of GIS hierarchy like reversing cameras trickling down the automobile product line. Like its economic cousin, trickle-down training tends to find a blockage where knowledge pools in one place (or person) and fails to reach the places where it would benefit an organisation most.

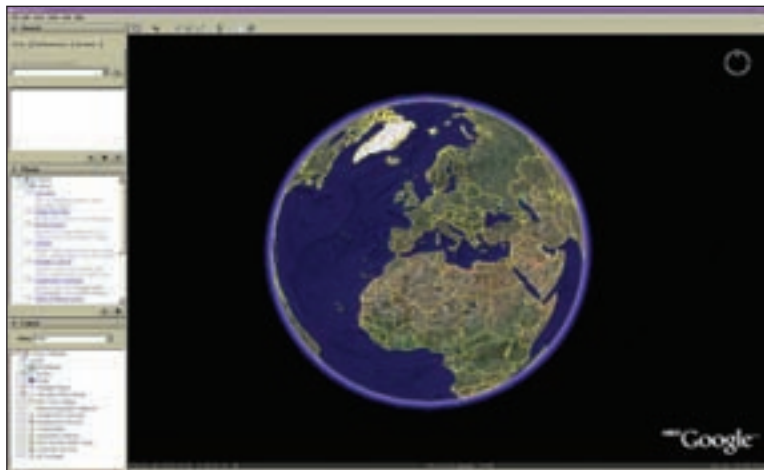
At the other end of the spectrum lurks the sweeping generalisation from oft-overworked and overstretched IT departments that GIS “is just another piece of software” that needs no special treatment and no special training. Once purchased and installed, the hapless user should be able to just get on with their work, producing maps and project conclusions without the terms metadata, data accuracy or data standards getting a single airing.

Perhaps Google Earth and Live Maps have added to this “GIS is simple” idea by bringing GIS to a global audience, the majority of whom have never heard of that particular acronym as they click on a point location to see some attribute data appear in a nicely rounded text box. But as simple a GIS as they might be, they were not simple to produce and brought through the keyhole such wonders as KML files and SketchUp rubies, with the former becoming a jewel with which any self-respecting GIS application should now be compatible.

In another vein, the spread of the increasingly ubiquitous SatNav has brought shortest-path algorithms and least-cost analysis to the un-GIS-initiated in the form of scrolling interactive maps that show a golden path that must be followed. Perhaps greater understanding of how those maps were created, or greater understanding of creating maps for the task they need to perform, might prevent the odd stray vertex at a junction creating the instruction to “turn left”, when turning left means driving along a railway line.

So, the dichotomy we face is that GIS is treated as either too complicated or too simple. As with many things, it is education that can combat both of these ills. Well written training makes GIS more approachable and more readily usable.

A well-designed training course for a beginner should start with the basics. By the basics I don't mean the design of the interface or what that weird icon with the funny Greek letter means but the fundamentals of GIS: vector data and raster data; resolution and data accuracy; projection systems.



Google Earth has helped bring GIS to a global audience even though they may never have heard of GIS

They might not be the sexiest of subjects but they are important. And with them comes one crucial reason why GIS is not just another piece of software; its data is unlike any other – a word processing document does not need to worry about scale, a spreadsheet is usually unconcerned with projections of a non-monetary kind. But to GIS, scale and projection are crucial concepts that must be understood before they can be correctly applied.

From these foundations the actual use of the software can begin and the usual discovery made by pilgrims embarking on such a journey is that GIS is not, after all, that difficult. The main difficulty after first use is not “how does that function work?” but “where has that function gone?” Show a person of reasonable IT skills how to select features by attribute data or how to apply a shading scheme to a spatial layer and they will be able to replicate those steps, just as soon as they’ve remembered how to access that function in the first place. But show them how to use that functionality whilst at the same time transferring the knowledge of why a function works the way it does, the reason for making a particular choice with a particular dataset and the implications of that choice and you take a step in creating a GIS professional with the knowledge to make informed choices when using any GIS application, not just the one on which they have been trained. This means that the core GIS skills that quality training develops transfers between GIS products so that the professional’s mind concentrates on the peculiarities of the data, its location and the task at hand rather than on the software itself. GIS software should, after all, be a tool with which to perform a skilled job, not one that limits how that job should be performed.

As with all software, familiarity with how it works comes from using it once the training is completed. Once that aura of unapproachability has been pierced, and a belief instilled that data standards are there for a reason, a beginner will soon develop a confidence that means their first proper map is just around the corner. And by proper map, I mean one that uses data designed to be used at the map’s scale with shading schemes employing statistical methods chosen for their accurate applicability rather than their aesthetic result. Too often, GIS maps are produced that whisper the old saying, “there are lies, damn lies and statistics” whilst incorporating the additional rider “and choropleth maps”.

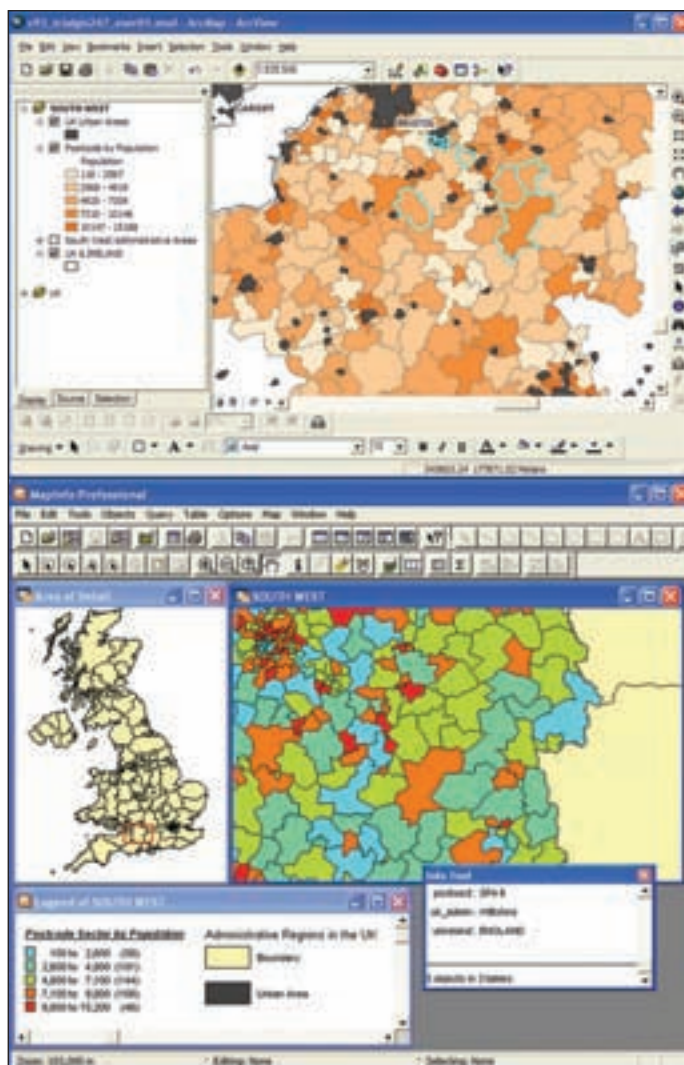
Data analysis is becoming simpler

Sadly, for many, their GIS experience begins and ends with the map. Their daily GIS-grind is one that entails: load data, symbolise data, produce a map, print map, repeat. Actual analysis remains an undiscovered country because “it seems a bit complicated” or because the job-remit does not require that particular skill-set. When a project rolls in that does require analysis, the work goes to somebody more senior and experienced who has done it before. This is a shame because the steps required to train a GIS mapper into a GIS analyst are simpler than many think. Certainly there is nothing wrong with training people to the skill level that they need for their job, whether that be to a beginner’s or to a mastering level but there are great personal and company-wide benefits to training GIS users to a higher level than their current role might demand. Once GIS users have their foundation in data formats, accuracy and scale, why not employ that knowledge to analyse the data being mapped?

The evolution of GIS applications means that complex spatial data analysis is no more than a couple of mouse clicks away. ArcGIS® can perform Hot Spot analysis through a simple tool with successful interpretation of its output requiring not complex statistical knowledge but enough statistical knowledge to interpret a z-score and understand the significance of “significance”. MapInfo® can restrict an entire set of spatial features to reach a goal set for the distribution of an attribute value with speed, accuracy and even-handedness that just requires knowledge of how the function achieves its goal for results to be applied to the real World. Of course, application of results derived from GIS is not made automatically without heeding other important factors or considerations, but producing them from GIS is not a task to be carried out by a fabled few but can be carried out by all. As long as the data going in is accurate for the task required, the results should be accurate too. Adherence to the old adage “rubbish in means rubbish out” means that our well-trained GIS professionals know to use the right dataset for the right job so that “quality in means quality out”. It is just a case of training personnel usually steeped in map production to the next level – the level that brings spatial relationships, proximity analysis, geographic joins and standardised scores into their skillset.

Intelligent training

Organisations can reap important and crucial rewards by training GIS staff to a higher level, especially in these times of tightening budgets and associated constraints, if that training is cost-effective and readily available. This is the objective of GIS247.com, an online training resource that seeks to empower professionals within an entire organisation to develop their skill-set when and how they want, to a greater level than traditionally possible. A well-trained department can complete GIS-related tasks more quickly and more accurately than their untrained counterparts.



Distributing GIS analysis tasks to personnel with the support of a rich information resource frees experienced staff to 'move on' whilst their map-based colleagues sink their teeth into proper analysis. This 'distribution' of work results in faster turn around times, bringing greater productivity gains with time freed for other projects that seemed forever stuck in the pipeline. Suddenly GIS becomes applicable to a wider range of projects and departments, its tendrils spreading out to encompass more and more subjects; highways, housing, environment, recreation. Better training – that means training available at multiple levels that teaches knowledge not just functionality - brings an increased return on hardware and software investment that can perpetuate a cycle of achievement where skilled personnel apply their talents to an ever broader range of projects that had previously reached the 'map' stage of GIS evolution but progressed no further.

"But what about staff-turnover?" cries the battle-weary manager worried that investment in training only makes skilled staff more likely to move on to where the digital hue is a little more green. Losing trained staff and gaining unskilled replacements is not unusual in any sector but here a new approach to training provision steps into the breach. GIS247 is a company-wide resource whose door is opened via a single fee. Once access is granted (on a global basis), an entire company can access multiple levels of training from beginner to advanced with specialist modules enhancing the resource so that unskilled and skilled can further their knowledge without costing the company a penny more. So, a single resource can train new employees whilst at the same time furthering the knowledge of experienced staff who have moved on to more complicated tasks.

This approach means that there is no need for a solely reactive approach to training, where a project requires a course so let's send somebody on a course. No continuation of the knee-jerk response to "investment in people" standards where a course (any course) is plucked at random for the benefit of bemused delegates who enjoy the break and the refreshments but don't really know why they are there. Intelligent training means training people intelligently, providing them with a resource that will increase their skill levels and benefit the company as a direct consequence through increased productivity and improved capacity to cope with more complex tasks than producing a map. No more attending a course and failing to consolidate so that

when a function is required the lessons learnt have long been forgotten and the course manual suddenly seems less approachable than it did at the time. Forget a lesson and just repeat it when it's needed; need to know how to use a function then access that material straight away; learn how to analyse some data whilst a colleague learns how to symbolise; treat training as an organic process where each individual can grow continually and simultaneously rather than stop-start learning where one person's gain causes another's stagnation.

A traditional approach to training treats learning as a treat to be enjoyed by a select few on a few occasions; the modern approach of GIS247 treats learning as a continuous process available to all whenever and wherever the need arises to develop personal and collective skillsets. The inexorable rise of the internet as an "information highway" confirms the business need for accessible information, 24 hours a day, 7 days a week; why should GIS knowledge be any different? Web-based training brings multiple benefits when well-written and professionally produced, especially when backed-up by training support that allows the trainer to answer trainee questions just like a traditional classroom-based scenario.

Conclusion

GIS is more than just software and data. It is a combination of these with the professional skills to make sure that they are applied correctly. There is little reason why these skills can't be developed more widely than might currently be the case so that as GIS moves from the 3rd into the 4th dimension, those that use it at the frontline are not left behind in the realm of the traditional map. A company's ability is little more than an extension of the skills mastered by its employees, so increasing the GIS skill levels of all employees will directly increase the skill level and capacity of the company itself. GIS is often defined by its ability to draw a pretty map but maps do not have to define the limit to what GIS and GIS professionals are capable of achieving. With the right guidance, the distance from map-producer to GIS professional is more of a small step than a giant leap.

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