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Software review: Atlas★GIS

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Atlas★GIS (AGIS) from Strategic Mapping Inc., is more than a sophisticated graphical database or mapping program for the personal computer. It is software that performs complex spatial analyses of data within a geographical framework. A geographic information system (GIS), gives the user the ability to associate virtually any event or transaction with a geographic location. From there sophisticated analyses of your data can be conducted. GISs go far beyond the more common thematic mapping programs.

AGIS's strength lies in its ability to build new information by creating new geographic features and data that can be displayed on either the CRT or printed/plotted. Geographic features are geometric representations of entities such as roads, waterways, rail lines, lakes, airports, highways. Other man-made features, e.g., voting precinct, supervisorial, census or school district boundaries, can be represented. Features are referred to as layers. The layers can be manipulated which permits various spatial analyses. By having one layer overlay another you create new features (layers) along with the attributes of each.

Attributes are simply information that describe the characteristics of the geographic features (length, perimeter, area, width, polygon type, etc.) and/or other data, e.g., traffic volume, sales, number of customers, associated with geographic features. Attribute files are independent of the map itself. You can think of them as tabular data where the columns contain data items and the rows contain the map features. The structure is like other types of relational databases.

There are two approaches to computer-based mapping. One is raster and the other is vector. Raster maps have no geographically related structure. Raster maps are actually collections of points or elements in a grid, the grid being the dimension (addresses) of your screen. These collections do not carry any information. Conversely, vector maps provide cartesian coordinates that are assembled in shapes that do carry information. AGIS is the latter type.

Among useful functions for the researcher or practitioner is address matching. AGIS has one of the best of the currently available GISs. AGIS imports records from your database. It imports most of the popular spreadsheet and database file structures. If the records have an address or zip code they are matched to a geographic coordinate. Those records are matched to line or point layers or even the intersection of two streets. You can do this interactively or in batch mode. The result, a datapoint file, is used to create a "pin map" of the occurrences of the user's data along with the information contained for each of the matched records. AGIS produces presentation quality maps of your data with complete control over the annotation. It's thematic mapping capabilities are excellent. Point, line, and region buffering are available as is point, line or polygon in polygon analyses. Overlays and area splits are handled very well.

From a researcher's perspective this tool provides the ability to see patterns and relationships among and between variables that might otherwise not be discovered. From the practitioner's point of view, the applications could include political redistricting, sales territory development, service area definition, or site location analyses. Both research and decision making can derive benefit from this type of technology.

AGIS has an intuitive feel. The menu bar lists groups of functions you can perform. Selecting one opens additional selections. The depth is comprehensive and context sensitive help is available. Documentation is exceptionally good with plenty of illustrated examples for first time users. It provides six predefined scripts that automate certain utility functions, e.g., the printing/plotting of multiple maps and applications such as sales territory development. Scripts is a programming language that allows for customizing the software. A tutorial is included as are a number of geographic and data files. Installation is straightforward. Many other materials to help users are available. While you can create (digitize) your own maps, Strategic Mapping Inc. also provides a wealth of ready-to-use geographic and data files grouped by county, state, country, or census tract, to identify a few.

The only feature missing that users may desire is a route optimization feature although future releases contemplate adding that capability. A separate program is currently available to achieve routing requirements.

Despite having said all of this, the reader may still be wondering . . . "So what?". A very broad example of one use follows. A school district was considering changing their grade level organization structure, i.e., what grade levels are provided at each campus. In this instance the district had one campus serving grades Kindergarten and 1st grade, another campus with grades 2 and 3 while the third campus served grades 4 through 6. Racial and ethnic balance were not an issue. When, however, the district wanted to change so that each campus served grades K through 6th, racial and ethnic balance at each campus had to be considered. Usually such a project is accomplished by staff collecting student information relative to grade and ethnicity. Then lines (attendance areas) are drawn on a map of some type. Then location of the students is represented on the map by pins, labels or some other means. Clearly the lines have to be drawn in such a manner as to ensure racial/ethnic balance for each site. To accomplish this manually consumes significant staff time, naturally depending on the number of students.

With AGIS the author simply obtained the student file, address matched it to the district base map and plotted the locations of the students by grade level and ethnic category. The database held information not only on the students but also the capacity of each campus so we knew how many children could be accommodated. We asked the district staff if there were any boundaries they had contemplated. Since the lines describing them were drawn on the map (on the CRT) and the system queried to determine the number of students by grade and ethnicity within each of the areas. A narrative report was generated and sent to the district showing that the boundaries upset the balance. We suggested that we be allowed to suggest the boundary definitions using our system and generate some alternatives that met the criteria. From the start of the project until it was delivered to staff was 4 days. During that time period five maps were prepared and plotted showing alternate boundary conditions along with narrative and tabular reports. If you substitute your database of clients, assets, or location specific occurrences for students, e.g., customers, registered voters, pet owners, vacant office space,

daytime burglaries, retail outlets with their attendant attribute data (all of which can be related to geographic layers) you begin to appreciate the applicability and power of a PC-based GIS as an integral part of any decision support system.

System Requirements: IBM or compatible 386, 640k memory, hard disk, PC or MS/DOS 3.x or higher. **Options:** math co-processor, mouse, digitizer, plotter. Cost of the software puts this technology in a price range that is affordable for most users. The program is network aware.

NOTE: Products are available for the Macintosh Computer.

