Introducing ArcGIS® 9.1 Business Analyst

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Introduction

Understanding the geography of business and markets is crucial for creating competitive advantages, marketing with results, and making strategic decisions. Businesses manage a wealth of information about customers, sales, inventory, demographic characteristics, mailing lists, and much more. At the core of this information is an address, a sales territory, a trade area, a service area, or a delivery route. This spatial component of business information provides a new dimension to how data can be examined, queried, and analyzed.

Information that was limited to spreadsheets and databases is being unleashed in a new, exciting way—all using geography. This is not your elementary school's geography. This is using geography, or location of information, to gain new insights and make better, more informed decisions. Consider an example: In Texas, a department store analyzing credit card receipts by ZIP Code finds that a large number of its customers drive along a particular section of the freeway to reach a mall. The store could then make smart choices about where to place its billboard ads.

Linking location to information is a process that applies to many aspects of decision making. Choosing a new site location, selecting a new market to expand into, targeting a market segment, and planning a direct mail campaign—all these activities involve questions of geography. Where are my customers and potential customers? In which neighborhoods or ZIP Code areas do consumers with particular profiles live?

Geography Matters

By examining the spatial components of business information, such as customer addresses, businesses can identify patterns and understand relationships not apparent from static tables and charts. Understanding the spatial aspect of company data provides businesses with insight about their customers' purchasing habits, financial behavior, and need for additional products or services. As a result, organizations are able to target their best prospects and not misdirect marketing and advertising resources.

There is an old real estate adage that the three most important aspects to a successful retail location are "location, location, and location." What works in Atlanta, Georgia, may not necessarily work in Los Angeles, California. This may seem like a simple principle, but business problems are rarely this straightforward. Consider the example of a retailer in New England that recently added two new store locations. Both stores have roughly the same number of people within a 15-minute drive time, yet one store performs much better than the other. Sophisticated spatial and market segment analyses revealed that the customers for the two stores had vastly different demographic characteristics. By adjusting the product mix in the underperforming store to better reflect the demographic characteristics of its trade area, the retailer was able to improve sales dramatically. Location-based analysis tools can help you determine which products and promotions match the lifestyles and buying patterns of your customers. You can create a

multidimensional snapshot of trends to plan trade areas, predict sales, design sales territories, plan media, and the like.

The location of your customers, the distribution of your store locations, and the competitive landscape all have a geographic component. Once you have a clear understanding of this spatial data, you can take advantage of that knowledge to serve your customers better than your competitors. The better you know your customers, your competitors, and your own business, the better you will be able to compete in the marketplace.

What Is GIS?

Geographic information system (GIS) technology combines layers of information about a location to give you a better understanding of that place. What layers of information you combine depends on your purpose—finding the best location for a new store, targeting new customers, or mapping the response to a direct mail campaign.

The key business principle that "better information leads to better decisions" is true for GIS. GIS is not just an automated decision making system but a tool to query, analyze, and map data in support of the decision making process. For example, GIS can be used to help reach a decision about the location of a new store that has minimal environmental impact, is located in a high-income area, and is close to a regional shopping center. The information can be presented succinctly and clearly in the form of a map and accompanying report, allowing decision makers to focus on the real issues rather than trying to understand the data. Because GIS products can be produced quickly, multiple scenarios can be evaluated efficiently and effectively.

Introducing ArcGIS 9.1 Business Analyst

ArcGIS® Business Analyst is an extension to ESRI's flagship desktop GIS platform—ArcGIS. ESRI® ArcGIS is a framework of integrated GIS software products for building a complete GIS that is right for every organization. ArcGIS Business Analyst provides advanced analysis tools and a complete data package to help make mission critical business decisions. ArcGIS Business Analyst combines ESRI's leading GIS technology with extensive business, demographic, and consumer household data to assist you in making critical decisions such as analyzing the market and competition, finding the ideal site for a new business location, or targeting direct mail. ArcGIS Business Analyst lets you perform sophisticated business analysis in one easy-to-use application.

By combining information, such as sales data, demographics, and competitor locations, with geographic data, such as census boundaries, territories, or store locations, ArcGIS Business Analyst helps you better understand your market, your customers, and your competition.

ArcGIS Business Analyst lets you

- Evaluate site locations.
- Perform customer or store prospecting.
- Define customer-based or store trade areas.
- Find a location similar to that of your best store.
- Conduct market penetration analysis.
- Create Huff models.
- Perform drive-time analysis over a nationwide street network.
- Integrate data and geography from the Web.

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- Analyze national data sets—no data extraction required.
- Connect to your own databases.

The following data and software components are included with ArcGIS Business Analyst:

- **Business Data**—This national database of approximately 11 million U.S. businesses from infoUSA Inc. can be used to identify customers or competitors and includes data by industry, sales volume, employees, geography, and more.

- **Shopping Center Data**—This national database from the Directory of Major Malls lists information for more than 4,450 major shopping centers, malls, and lifestyle/ specialty centers in the United States. Data variables include center name, Gross Leasable Area (GLA), type of center, total retail sales, distance to the nearest competing center, distance to the nearest major city, nearest major city, and total number of stores. In addition, information for up to four anchor stores is included such as store name and square footage.

- **Street Information**—The nationwide street database in ArcGIS StreetMap™ USA from Tele Atlas North America (formerly Geographic Data Technology, Inc.) is based on Tele Atlas' flagship Dynamap streets database and provides a nationwide basemap for routing and drive-time analysis.

- **Demographic Information**—ESRI offers more than 1,000 variables, including 2005 and 2010 projections, along with 2005 estimates for employee population; population by occupation/industry; disposable income; consumer expenditures by state, county, ZIP Code, tract, and block group level; and, at the census tract level, Tapestry market segmentation data.

- **Centrus Geocoder**—The Centrus Geocoder from Group 1 is the leading address geocoder that will allow you to point-plot all your address information. ArcGIS Business Analyst provides the Centrus Desktop address geocoder that will allow you to batch code your address data in a variety of different data formats.

- **Crystal Reports**—ArcGIS Business Analyst uses Business Objects' Crystal Reports 9 to generate all reports. You can use the preloaded reports in Business Analyst or use the Crystal Reports designer to create your own tables, reports, and charts.

Incorporate Your Own Data

While ArcGIS Business Analyst comes with a wide variety of its own data, Business Analyst tools and applications also function with your own information such as store locations, competitor locations, sales data, and customer data. ESRI continues to focus on providing technologies that enable organizations to easily share information across applications and industries, regardless of data format, schema, or database management. ArcGIS Business Analyst contains a series of tools and wizards that allow you to incorporate your own information directly into the system. With the many database connection utilities in ArcGIS Business Analyst, organizations are able to connect directly to local and networked data as well as data in large relational database management systems such as Oracle and SQL Server. For example, if your organization houses your customer information in an Oracle database, ArcGIS Business Analyst will

be able to connect and read this Oracle data directly. You no longer have to wait for your systems department to create data extracts or spend unnecessary hours importing data into your business system. Business Analyst also allows you to incorporate file-based data such as Microsoft Excel spreadsheets. The extension directly reads data, and you can interact with your own information in its native format.

GIS Tools for Business

The following is a brief summary of the many tools and applications available in ArcGIS Business Analyst.

■ **Site Location Market Analysis**—ArcGIS Business Analyst includes a series of store market analysis tools that allow you to find the best potential new site locations. Using your own information and demographic data sets, you can define your trade areas using the following tools:

- **Simple ring**—Create rings around your stores using a radius you specify.

- **Data driven ring**—Create rings around your stores using a radius proportional to a store characteristic such as total sales, square footage, or GLA.

- **Equal competition**—Create trade area boundaries halfway between each store and its neighboring stores (Thiessen polygons).

- **Drive time**—Define areas accessible along the street network based on your specified maximum travel time or distance.

- **Huff model**—Predict the sales potential of an area based on distance, competition, attractiveness factors, and consumer spending.

- **Threshold ring**—Create rings containing a specified population or household count.

- **Grids**—Find hot spots in new markets by creating grids of specified cell size for your study area and append demographic data.

- **Cannibalization**—Monitor how your trade areas change over time and how new stores will cannibalize existing markets.

- **Find similar**—Rank a series of locations and compare them statistically to a high-performing location. Find other locations for successful stores.

■ **Customer Market Analysis**—ArcGIS Business Analyst uses your customer data to define your stores' trade areas and analyze the corresponding markets. The results of this analysis provide a foundation for implementing marketing programs. ArcGIS Business Analyst lets you perform customer market analysis by

- Drawing market area boundaries around sets of customers based on customer counts or customer sales

- Drawing desire lines between customers and their assigned stores to identify market pull

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- Calculating market penetration based on the number of customers within an area compared to the total population

- Finding new locations around the center of a group of customers

■ **Customer Prospecting**—You can use the customer prospecting tools in ArcGIS Business Analyst to identify and target your best customers. There is a wide variety of customer prospecting tools that will enable you to

- Conduct queries based on demographic or other data.
- Profile your customers to find more like them.
- Target your marketing campaigns.

■ **Reporting**—ArcGIS 9.1 Business Analyst includes a new reporting engine that will allow you to

- View your reports on-screen or have them produced in a number of popular desktop formats including Adobe Acrobat PDF, HTML, Microsoft Word, and Microsoft Excel.

- Generate reports one at a time or produced in a new batch framework.

- Rank markets based on demographic data.

- Produce proximity reports that can list your closest competitors.

- Produce reports with Business Analyst data *and* your own data.

A GIS Business Toolkit

ArcGIS 9.1 Business Analyst offers a completely new framework for working with tools that enables you to launch them individually, combine them in a visual modeling environment, write scripts in standard scripting languages, and run the tools as commands in a command line window.
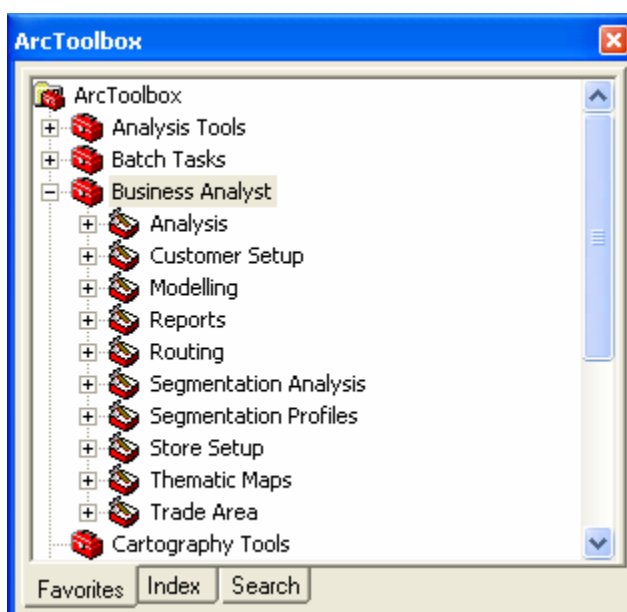
You can also create models that will execute a sequence of Business Analyst functions. For example, a store layer created in one function becomes the input for a trade area function, and so on. Models are viewed and edited using the integrated ModelBuilder™ window. The ModelBuilder window lets you drag and drop tools and data into the model diagram to build processes that can be connected into a logical flow. You can run a model from within the ModelBuilder window and inspect the flow of control. Models can also include scripts and other models as steps. You can save models in toolboxes and use them as tools or distribute them to other users. A model can also be exported from the ModelBuilder window as a script, so you can first build a process as a model, export it as a script, then add additional automation or advanced flow of control.

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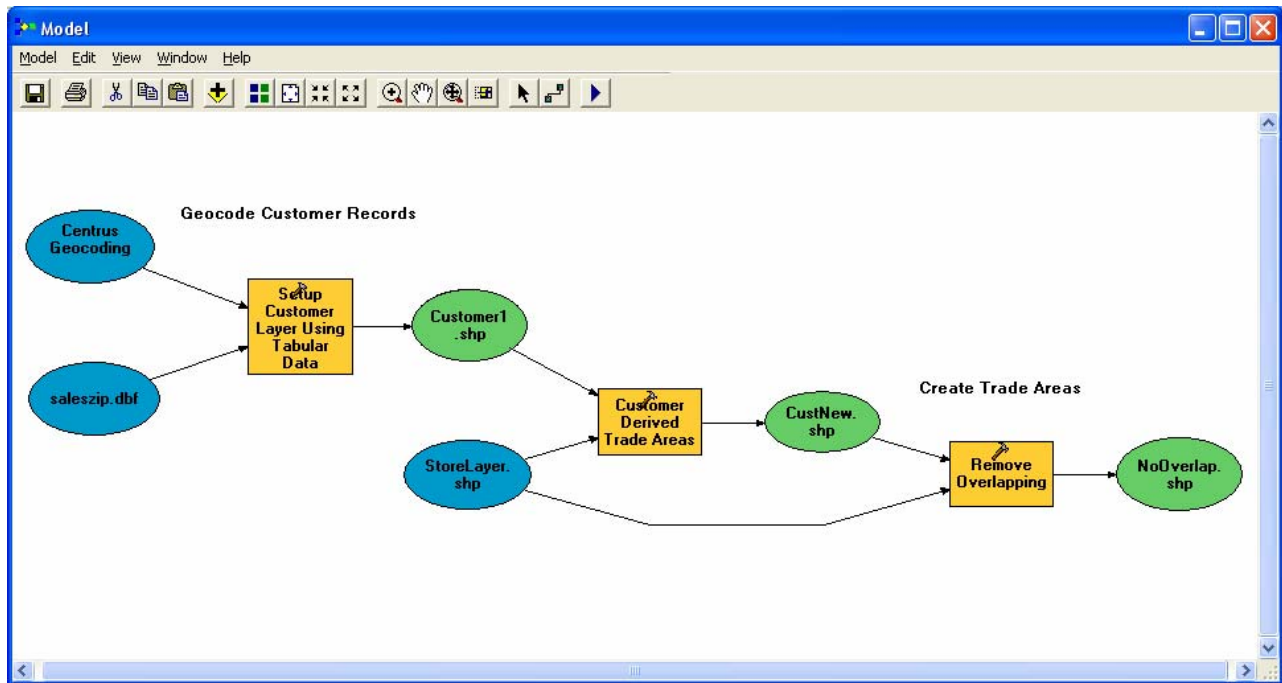
***ArcGIS Business Analyst in Action: A Retail Case Study***

ArcGIS Business Analyst is used by a wide variety of companies, economic development departments, and nonprofit organizations to make informed business decisions. Business Analyst has widespread applications throughout real estate and marketing departments. Real estate departments use Business Analyst to determine optimal new site locations and reevaluate current locations. Marketing departments use Business Analyst to better understand where current and potential customers are located in order to tailor specific marketing messages and target campaigns.

The following section outlines how a retail chain can use Business Analyst in its marketing and real estate departments.

Locating a new store site is a critical business decision. Making a poor site location decision is extremely costly when you consider the real estate, planning, construction, and marketing efforts that are involved in adding a new store location. Business Analyst contains a number of tools and utilities that will allow you to evaluate and determine optimal new site locations.

Business Analyst allows you to create trade areas around new and existing stores that will help you evaluate their potential or existing sales performance. The image below illustrates some of the popular trade area techniques that are included in Business Analyst. For example, you can create drive time around a site to determine how long customers are willing to travel to visit a specific store. Or you can create a customer penetration-based trade area that represents the closest 80 percent of your customers. These trade areas can then be used to create reports and append demographic, consumer expenditure, or survey data. This information can be used to evaluate existing or potential performance of a network of store locations. For example, you can use the

demographic characteristics of trade areas around three potential new site locations to determine which one is likely to be more successful. If a store has more of your key customers in close proximity, it is likely to be more successful.
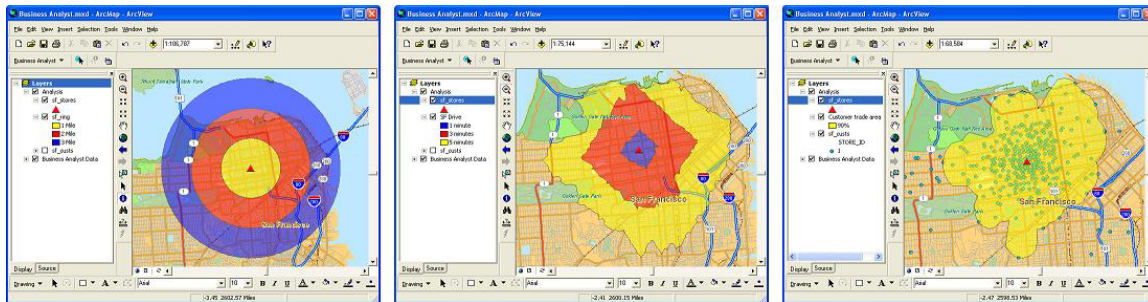
Business Analyst also includes sophisticated spatial interaction models that can be used to estimate the performance of potential new sites or even estimate the market share of your competitors. The sales forecasting and market share models are based on the following premise: the probability that a person confronted with a set of alternatives will select a particular item is directly proportional to the perceived utility of each alternative. The model uses a number of principles to estimate the performance of a given site. Specifically, the model takes into account the competitive landscape (including the attractiveness of competitive locations) and the distance from the site and utilizes consumer expenditure data to determine the likely performance of a store location.

The image below illustrates one of the map outputs from the Huff model in Business Analyst. The map thematically shades census block groups in and around a store location in San Diego, California. The darker red represents areas that have a higher probability of consumers shopping at the new store location. As the image illustrates, the distance from the store location and the competitor stores (green dots) impact the probability of shopping at this new location.

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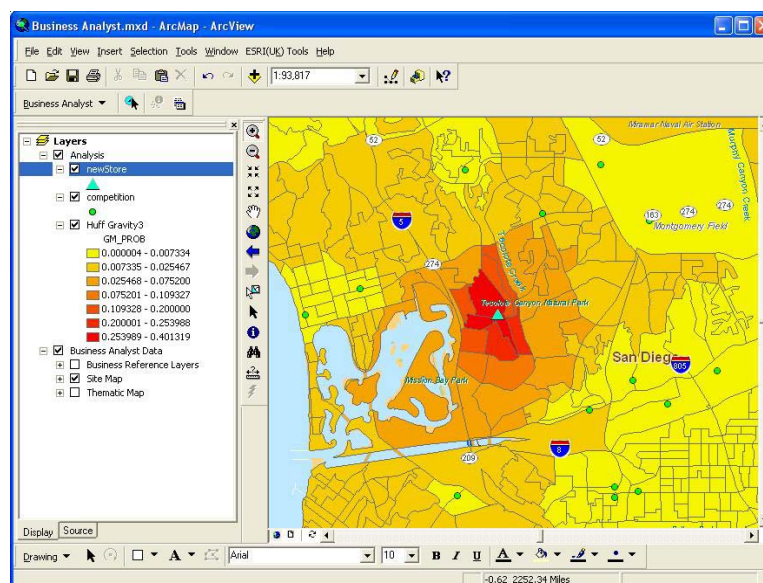
The probabilities of each of these areas can then be combined with consumer expenditure and demographic data, included with Business Analyst, to estimate the sales potential for a new store location. The model can be further refined by calibrating the results against actual customer behavior data.

Business Analyst also includes a wide variety of marketing applications that will allow you to examine and profile your existing customers. These marketing tools allow retailers to better understand who and where their best customers are located. The image below illustrates one of the popular customer prospecting wizards in Business Analyst. This tool allows retailers to find locations that match a set of criteria that can be determined by an existing set of customer records. For example, your target customers may be young adults who rent and have an average household income of $35,000 to $50,000. With the Customer Prospecting wizard, you can find areas that meet these criteria. These areas can then be mapped to help you better direct your marketing efforts.
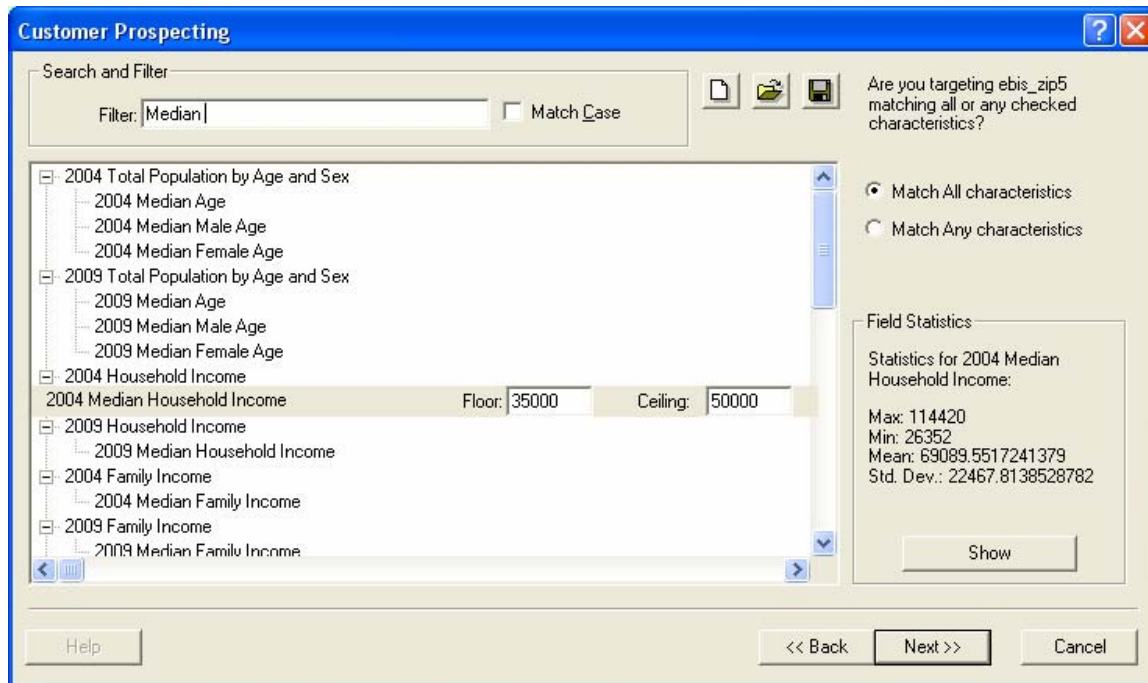
There are a number of other marketing-focused tools within Business Analyst that will allow you to determine who are your best customers. More important, when you have identified your best customers, Business Analyst will let you know where you can find more of them. The map below illustrates how the Customer Prospecting wizard can be used to identify areas where your marketing efforts will be served best. The dark red areas below contain high concentrations of a store's target customers. Direct mail, advertising, and customer loyalty efforts can then be directed in these areas to receive the best return on your marketing investment.

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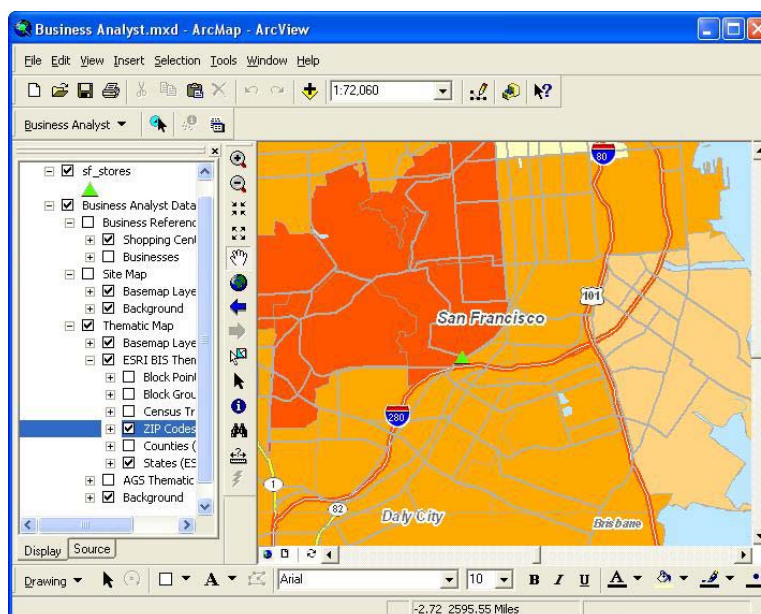
*Neighborhood Segmentation: Using Community Tapestry*

A new neighborhood segmentation module is available as an optional module to ArcGIS 9.1 Business Analyst. This new "add-on" module is based on ESRI's Community™ Tapestry™ segmentation system. The Community Tapestry segmentation system provides an accurate, detailed description of America's neighborhoods. U.S. residential areas are divided into 65 segments based on demographic variables such as age, income, home value, occupation, household type, education, and other consumer behavior characteristics.

You can use the Segmentation module to profile customer databases. These profiles help you estimate product usage and market potential more accurately, perform competitive analyses, identify cross selling opportunities, and reveal secondary markets. Your customer profiles can be compared to other profiles that are created in the Segmentation module. You can create profiles based on your trade areas, standard geographic areas, and Mediamark Research Inc. survey questions.

Once your profiles are created, you can create segmentation reports, maps, and charts. These reports can be used to answer questions such as

- Who are my customers?
- Who are my best customers?
- Where can I find more customers like them?

The Segmentation module includes a number of tools that help you identify target groups of Tapestry segments. You can create maps, charts, and reports based on these targets and identify segments of customers you want to target. The Segmentation module also contains a powerful tool that will allow you to combine segmentation analysis with other Business Analyst reports to create a Segmentation Study Book.

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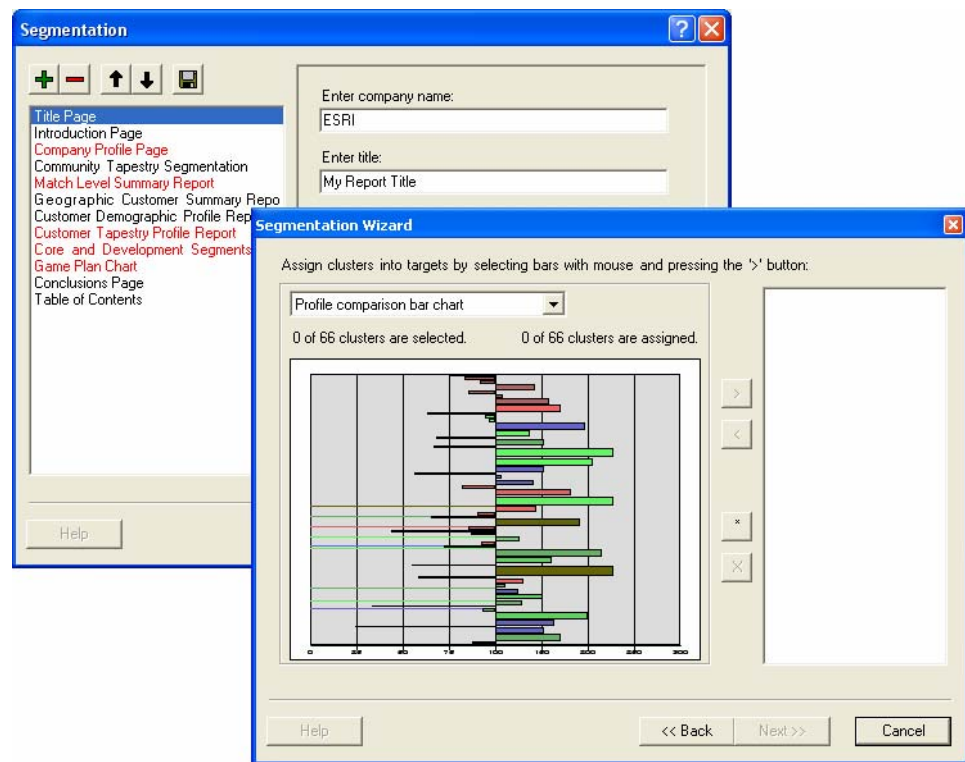
Conclusion   Understanding the geography of business is crucial for creating competitive advantages, planning effective marketing, and making informed business decisions. ArcGIS Business Analysts allows organizations to manage a wealth of information about customers, sales, inventory, store locations, demographic characteristics, and much more. ArcGIS Business Analyst combines ESRI's leading GIS technology with extensive business, demographic, and consumer household data to assist you in making critical decisions such as analyzing the market and competition, finding the ideal site for a new business location, or targeting a marketing campaign. By combining your own information, such as sales data, demographics, and competitor locations, with geographic data, ArcGIS Business Analyst helps you better understand your market, your customers, and your competition. Using the tools provided in Business Analyst, you can identify patterns and understand relationships that will allow you to make better site location decisions, target your best prospects, and better direct marketing and advertising resources.