GEOGRAPHICAL INFORMATION SYSTEMS USED IN BUSINESS ENVIRONMENT

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Abstract:

Communities are constantly in competition with one another to attract businesses. New and better ways to market a community constantly go through experimentation. One tool that has come to the forefront is the use of a geographic information system (GIS). Lately, more and more communities are adopting this tool for land use planning and for economic development planning

***Geographical Information Systems (GIS)** are used for inputting, storing, managing, analyzing and mapping spatial data.*

*This article consider the role of each function that a GIS can play in economics:*

➢ *map economic data with a spatial component;*
➢ *generate additional spatial data as inputs to statistical analysis;*
➢ *calculate distances between features of interest;*
➢ *define neighborhoods around objects;*
➢ *introducing new data.*

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Geographical Information System (GIS) is an Informational System that allows inputting, storing, managing, analyzing and mapping spatial data

GIS is a tool that allows people to visualize issues geographically. Information is linked in the form of a data table to a variety of features such as points, lines, and polygons, when combined, result in a map. However, the data can also be used to create graphs and models.
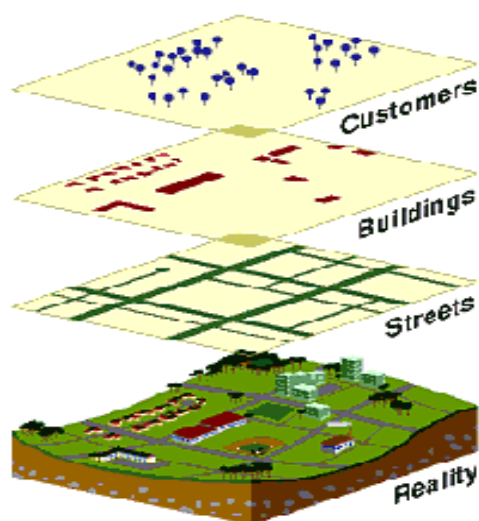
Data can be added to and modified over time

and is accessible with the click of a button. Distance between objects can be observed as well as spatial patterns, quantities, or barriers that were not noticed just by looking at the information in paragraph or numeric form.

After a person visualizes the information in this new way, it is then possible to make decisions or adjust the information to include hypothetical situations. Example: Determining if there is a relationship between forest area and the lifespan of squirrels, or determining if there is something in the southern area of the map affecting the squirrel population (perhaps industrial waste…).

In order to make a general image about „what is a GIS?" let's emphasize some questions that a GIS can respond:

- „What can we find at...?"- that means to localize a certain spatial data. A location may be presented in many ways, such as: What represents a certain characteristic? Is a warehouse, a retail or an individual client? Which is the sales volume, or stocks in that location?
- „Where is...?" – that means the expression of a condition. More exactly, instead to identify what we find at a certain location,

we want to identify which are the locations that satisfy a certain requirement.

- „What changed at...?" – that means evolution. It determine time relief of a zone. For example, which is the amount of goods daily merchandised at a certain location, during a year?

- „What happens if...?" – that means modeling. For example, what happens with a service provider clients, if in the same area appears another competitor?

A regardful analyze of the type of data used in business environment shows that most of them have a spatial nature. For example:

o A factory has points of loosens
o An warehouse is connected to a chain of commercial societies
o Commercial societies has clients that live in a place and work in another place
o A bank has many branches, each having relations with societies or persons, scattered on a certain territory.
o A communications society has equipments on neighborhoods.
o Chamber of Commerce and Industry keep the evidence of all commercial societies that have a territorial spreading, at a city level or county level.

GIS are used in business, administration, some academic disciplines and economics. The most frequent application in economics is the use of GIS to visualize or map economic data with a spatial component.

More generally, it is the ability of GIS to reconcile spatial data from different sources that allows the creation of new data sets. In the simplest case, this may involve combining socio-economic data from different spatial units.

GIS also introduce economics to new sources of data. These data sources allow the description of different features of the economic landscape that one might seek to explain.

Like GIS (Geographic Information Systems), economic development is a term that applies to a variety of activities. Economic developers from the public sector usually see it as the process of expanding economic activity in their community in order to reach the community's economic and societal goals . Generally, the public sector economic developers aim at enhancing the quality of life for all people in their territories through employment opportunities and the expansion of economic and tax bases.

Public economic developers often work very closely with their private counterparts in the utility, transportation and telecommunication industries. Companies in those industries benefit from economic growth through the increased sale of their company's products and services.

Economic development involves a lot of players: location consultants, engineering firms, lawyers, planners, commercial agents, the society as a whole and, the expanding or relocating companies. Here we take the perspective of an economic developer.

Economic developers market a territory. Their business is centered on location. GIS has proven to be very useful in asset management, suitability analysis, policy making and impact analysis, site selection and marketing, etc.

Asset Management
GIS is be used to:
- Discover where the largest return on infrastructure investment is likely to be
- Analyze the length of time properties stay on the market unproductively
- Find out the best locations for speculative buildings or business parks

Many relocating or expanding companies have short product cycles and therefore cannot take the time to build facilities from the ground up. Therefore, they often focus exclusively on existing buildings. Communities without available or appropriate buildings find themselves at a strong disadvantage. To remedy to the situation, they may build a facility before finding a buyer or tenant. This is a risky but sometimes necessary strategy. Even when buildings are well designed and are expandable, they may stay on the market for years if they are not well located. GIS can help reduce this risk by selecting the right location.

Suitability Analysis
GIS is used to find:
- The best areas of growth
- The type of economic development activity that is most suitable
- Where environmental, transportation and other factors may restrict development

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Site Selection and Marketing

Site selection and marketing is probably the economic development GIS application with the fastest return on investment. In this case, GIS is used to inventory, organize, analyze and present economic development data to retain or attract companies into an area.

Why using GIS? Further are presented some perspectives

The Information Technology Perspective

Today, multimedia GIS is the best technology to deal with eclectic and location-based site selection data. It offers the benefits of traditional database and multimedia systems while adding powerful spatial, analytical, map publishing and data integration capabilities. The releases of Internet map servers strengthen its leading position.

The Economic Developer's Perspective

Using GIS, economic developers gain a competitive edge by:

- Delivering superior multimedia and analytical presentations
- Generating more leads at trade shows
- Finding the optimum location for expanding or relocating companies
- Increasing communication with prospective clients by testing location scenarios in real time
- Shortening the time spent on projects thanks to the early selection of optimum locations
- Printing customized maps and reports on demand
- Building partnerships, consensus and support

The Corporate Executive's Perspective

Due to restructuring, few companies have corporate real estate executives. The tasks that were traditionally assigned to them have been distributed among other executives and passed to lower levels of management. A large proportion of a company's assets remains tied to real estate. A typical executive in charge of the site selection is overworked and has never dealt with a major relocation or expansion before. He/She is willing to listen to good advice and often hires a consultant to help in the process.

GIS gives economic developers the chance to become trusted advisors to the site selection team as well. Not only does it provide needed information but it inspires confidence in a community's responsiveness and professionalism; a community to do business with.

Companies gain from an economic development GIS because:

- The information received is better:
  - Professional quality
  - Customized, therefore more relevant
  - Easy to understand
  - Delivered promptly
  - Better than that available from non-GIS communities
- The sites and buildings recommended match the criteria specified, which:
  - Saves on analysis time, travel and money
  - Keeps everyone more focused within and outside the company
  - Speeds up project turnaround time which ultimately brings new products to market faster

As a direct result, the company research team has an easier job justifying the community with a GIS to its executives and board of directors.

The Need for an Application-Oriented GIS

A typical site selection involves complex tabular queries and spatial (theme-on-theme) analyses. This complexity makes it next to impossible to use generic GIS systems as powerful real-time analytical demonstration tools. Generic GIS are best used by GIS specialists in the "back office". Their major strength for economic development is their flexibility.

Application-oriented GIS systems should be accessible to every economic developer. They have important characteristics missing in generic GIS systems:

- Ease of use through extensive use of forms and close focus on the economic development process
- Speed, thanks to the built-in economic development functionality
- Consistently professional and pleasing look

Effective economic development strategies depend on answering many questions that are basically geographic in nature. For example,

- What is the spatial pattern of businesses and households within a community?
- Where are the best sites for a proposed industrial park?
- Which retail sectors are underrepresented

within a community?

Geographic Information Systems (GIS) offer a powerful way to combine consumer and business data in a geographic framework to help answer such questions as these:

? A GIS is a software database program that runs on personal computers.

? The key feature of a GIS is that it links the spatial location of an object (e.g. a town, business, or county) with data and information that are associated with the object (e.g. the population, median income, and employment base of a county).

? Any information that has a geographic location associated with it can be stored in a GIS and used to answer questions that have a geographical dimension. For example
  • What is the spatial pattern of gas stations within an area?
  • What areas have the highest customer potential for a particular retail sector?
  • Where are the concentrations of high or low income households within a community?
  • How accessible is a particular location to key transportation routes?
  • Where is the optimal location for a new health clinic?

The business data and mapping service is based on the integration of several business information systems and technologies. It provides a high-powered source to help businesses identify and analyze market opportunities. An extensive library of geographic, business, and demographic databases can be fully integrated with most proprietary and customer information databases. Many analytic tools have been developed for a wide variety of industry-specific needs. GIS main objective is to help business grow.

Using a GIS mapping services we can answer such questions as:
• Where are the customers? Suppliers? Competitors?
• Where are the best markets for a new business or expansion?

• Where are the best and least performing markets?
• How many manufacturers are within 5 miles of the site?
• How many distributors are within 2 miles of the highway?
• How many consumers purchase the product within a certain area?

GIS solution for business

Many companies have already implemented GIS solutions to improve their activity. Here are some examples:

Mobile personnel management. Company „X" is a service provider for sanitary devices. Most people who calls for assistance are bad-disposed, so is very important to reach very quick to their location and fix the broken sanitary device. Otherwise, they call another company. But is not easy to efficiently itinerate the appropriate worker to a certain location because almost 90% of interventions are emergency. Using a GIS, when a client calls, the dispatcher introduce the location, a map is created – showing client location reported to engineers locations. The dispatcher see not only the closest engineer but he can see the stage of his actual job: if just started or almost over. Knowing these details, he can make the best choice.

Special delivery. GIS help companies to satisfy each client. The dispatcher see all the time each location of the company cars and also impatient clients can see, real-time through web, where are their goods in traffic, and what speed they reach.

Is GIS really worth it?

Overall, the consensus has been implementing a GIS for a community pays for itself in a relatively short amount of time. If communities want to stay competitive in attracting new businesses, they will need to invest in a GIS. Businesses able to go to a community's website and browse properties will seriously consider these municipalities. Communities can also use the technology to easily identify underutilized properties, vacant parcels, industry clusters, blighted areas, and more.

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