A SHORT NOTE ON GIS AND BUSINESS INTELLIGENCE

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BI (Business Intelligence) is the use of information that enables organizations to best decide, measure, manage, and optimize performance to achieve efficiency and financial benefit (Gartner – 2006) (GIS and Business Intelligence, 2006).

The term 'Business Intelligence' was coined in the mid-1990s to describe the emerging practice of transforming raw data from an organization's disparate operational data into a common data warehouse that could be used for discovering and reporting information [1]. It refers to technologies, applications, and processes for gathering, storing, analyzing and providing access to data. The aim of BI is to help enterprise users make better decisions. BI is the combination of processes, business rules, and technologies that take raw data, organize it into meaningful and actionable information, while ensuring that it reaches the right people at the right time to support business decisions. BI unlocks the value held in the business's disparate data depositories by turning it into knowledge and insights, and delivering it to whoever needs it, when they need it, where they need it, and in the format they need it in.

BI applications include the activities of: Decisions Support Systems, Query and Reporting, Online Analytical Processing, Statistical Analysis, Forecasting and Data Mining. BI applications can be Mission critical and integrated into a company's business operations, or Occasional to meet a specific requirement or Answer a specific question, or Enterprise wide or limited to one business unit or project (Posthumus, 2008).

GIS (Geographic Information System) is a mature technology that began in university departments of computer science in the late 1960s. The seminal idea was associating data with geographically referenced map graphics to allow an understanding of the influence of geography on behaviors and outcomes. Today's GIS recognizes the location component of data and associates data with geographic features like graphic representations of actual features, such as roads, rivers, forests, and conceptual features such as political boundaries or service areas maintained in a GIS. Associating data with features lets users organize data based on the geographic location of each record in the data. This geographic organization, presented as a map, reveals spatial relationships and influences that cannot be identified in traditional tabular views of data [1].

Convergence of BI with GIS Technology

There are many different methods of applying GIS in business intelligence environments, some of the best and most effective ways to present spatially-oriented enterprise data is through (Business Intelligence Advantages, 2007):

+ **Thematic mapping**, which collects information associated with pre-defined geo-coded data points (i.e. the addresses of branch offices), aggregates them to the appropriate geographic regions, and displays them on a map.

+ **Customer dot mapping**, which presents client

locations as dots spread across a defined area map. More advanced customer dot mapping can show customer locations with respect to store locations.

+ **Trade area analysis**, which displays the locations of members of a target audience, and uses various graphic techniques to indicate specific traits and behaviors. For example, a grocery retailer can view potential customers, and color code them based on annual household income or use different shapes to indicate number of family members.

+ **Spatial interaction modeling**, which uses trends in historical demographic data to forecast future events in a specific location. For example, based on the average length of time each family lives in a home, and the number of houses that have been sold in a given region over a certain time period, real estate firms can predict how many homes – and which ones – are likely to be put up for sale over the next several months.

Merging GIS and BI technology produces results that extend beyond simply visually representing data on a map (Posthumus, 2008), as shown in Fig 1 (Clarke, 2007).
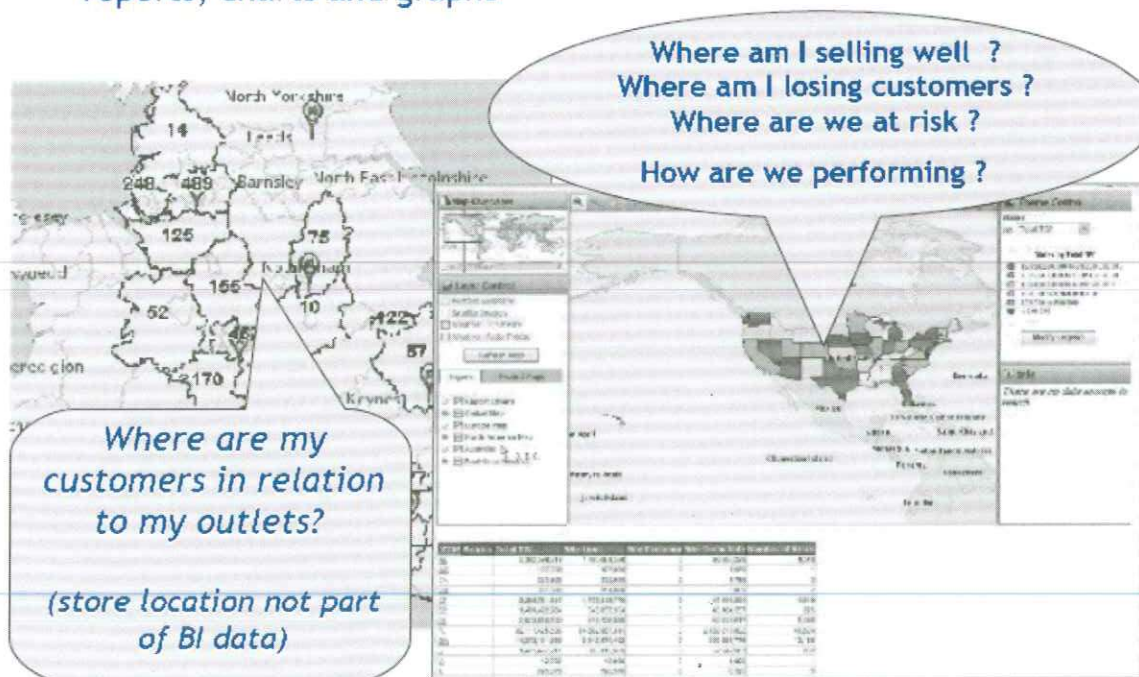
Organizations can better visualize and interpret their spatial information by integrating advanced mapping capabilities into their business intelligence environments, and gain insight into the vital relationships that exist among it (Business Intelligence Advantages, 2007).

Business areas where GIS can add value include:
Retail trade area, Customer segmentation and profiling, Branch merchandising, Target audience sampling in market research, Credit and geographic risk management, Market share estimation, Route optimization, Logistics and fleet management, Network planning optimization, Physical asset tracking and management (Posthumus, 2008).

Map4Decision combines business intelligence and geospatial to explore data and enhance decision-making

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A map allows users to see spatial patterns, trends and view relative performance that are often impossible to see using only reports, charts and graphs

Where am I selling well ?
Where am I losing customers ?
Where are we at risk ?

How are we performing ?

Where are my customers in relation to my outlets?

(store location not part of BI data)

process .
+ It easily explores data with intelligent cartographic functionalities.

+ It creates maps, tables and statistical charts, without the help of a GIS specialist.

References

1. GIS and Business Intelligence: The Geographic Advantage, ESRI White Paper, 2006

2. Rudi Posthumus, Standard Bank, 'GIS as a Tool in Business Intelligence', PositionIT, May/June – 2008, pp (71–74)

3. Chris Clarke, 2007, 'Business Intelligence and Location Intelligence – A Perfect Fit', Director, Business Development – EMD.

4. Business Intelligence Advantages, 2008,

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