Chapter 6
Geographic Information Systems and Its Applications in Marketing Literature

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ABSTRACT

Geographical Information Systems (GIS) are the systems that store location based data and analyze them. In this study, GIS is defined and its importance and functions are described. Usage of GIS in marketing area is explained in details and finally number of academic publications about GIS in general and in marketing literature for decades are analyzed through five different and some of the mostly used databases in social sciences, which are Ebsco, ProQuest, Sage, Springer and Science Direct. Since the importance and usage of GIS in marketing applications and literature increases, however its ratio in total GIS literature is not sufficient yet.

INTRODUCTION

Information that is required in marketing activities is gathered through some tools and geographic information systems are one of them. Its usage raises as its importance are realized in marketing activities. By means of geographic information system (GIS), collecting tremendous data, storing them in database, updating when required, analyzing, drawing visible maps based on analyses, accessing the necessary information obtained as a result of analyses are possible. A GIS is essentially a digital map linked to a database management system which can be used for the purposes of displaying and querying information, carrying out spatial analysis and assisting in the decision making process. Although GIS's emergence is not so old, its usage spreads rapidly in many different areas such as geography, criminology, archeology, education, tourism, management and marketing. With combination of geography and marketing disciplines result in emergence of a study area which is called geomarketing. Geomarketing is a recent discipline that combines the geographic visualization and analysis with marketing techniques, aiming at more efficiently attaining the ultimate goal of organizations. Important marketing activities such as segmentation, positioning and research can be performed more effectively through geomarketing. These

activities, then, are called as geo-segmentation and geo-positioning. Locations that customer prefer to live provide many important information about their habits for marketing professionals, so that making decision with ignoring this data result in economic loss and decrease in market share. GIS has also an important attractiveness in academic publications in different academic disciplines. In this chapter, the theories, which are used in marketing literature, that using geographical data in order to predict the preferences of customers were explained. These theories are central place theory, trading areas, gravity models, and analog modeling. Additionally, through five different databases, numbers of academic publications about GIS and marketing were examined over the years.

BACKGROUND

Geographical information systems (GIS) are defined as an integrated collection of software and data that is used to visualize and organize location-based data for the purposes of performing geographic analyses and creating maps (Wade & Sommer, 2006). GIS is capable of assembling, storing, manipulating, and displaying geographically referenced information (Coyle, 2011). It combines maps, tabular data and analysis capabilities. It allows users to take information, view that information spatially and analyze that information so users can reach conclusions through correlations (Elliot, 2014). As with most technologies, the effective use of GIS depends on the person using it, rather than the technology itself (Fung & Remsen, 1997). GIS is analytical so that able to answer such questions as: "what is adjacent to this intersection?", "what are the conditions like within 15 km. of this point?", "how far is the nearest water line?" (Black, Powers & Roche, 1994).

The first modern GIS system was used in 1962 in Ottawa, by the Canadian Department of Forestry to map land use and data about farming and wildlife. The designer of the system was Roger Tomlinson, who was asked by the Canada Land Inventory project to pursue his idea of using computers to combine maps and statistics. In 2007, Tomlinson stated that he thought GIS would be implemented by just about every modern business (Coyle, 2011). GIS has applications in many different areas such as geology, defense, population, environment and local governments (Bensghir & Akay, 2006). GIS is now a tool that finds application in most fields of human endeavor at local, regional and global levels (Musyoka et al, 2007). As businesses, such as large retail companies and advertising agencies, begin to see the benefits of this technology that assists in spatial-based decision making (Smith, 2005). GIS software continues to be popular as it allows users to manipulate free downloadable data and to create their own data in an unlimited way, as opposed to a web mapping application where the user is limited to what the designer provides (Donnelly, 2010). ESRI (Environmental Systems Research Institute) software is used by 300,000 organizations worldwide, including 7,000 colleges and universities. There is currently a growing movement in the development and adoption of free and open source software (FOSS) for GIS (Donnelly, 2010). GIS has three distinct and unique advantages for economic development (Black, Powers & Roche, 1994):

1. GIS permits the disaggregation and re-aggregation of sub-county data, which offers a level of customization and accuracy not otherwise possible.
2. The technology is designed to overlay and compare different variables or types of data so that the relationships between important decision-making factors can be understood.

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