

# Software review: How is geography supporting marketing in today's commercial organisations?

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He is well known in the industry, regularly speaking and running specialist workshops at leading industry conferences. He has had a number of papers published in the UK and overseas on the application of database marketing.

**Abstract** The wider availability of Geographical Information Systems (GIS) for use in marketing is encouraging growth in the business application of these technologies. This paper explores how geography is now being used to support marketing activities in a range of industry sectors.

## DEFINITION

A Geographic Information System (GIS) is a tool that allows data that can be referenced spatially, ie data that can be tied to a physical location, to be organised and analysed. Many types of data have a spatial aspect, including demographics, marketing surveys and epidemiological studies.

GIS software generally use two basic types of data:

- spatial data: containing the coordinates and identifying information describing the map itself
- attribute data: containing information that can be linked to the spatial data, for example, matching addresses or coordinates in the spatial data.

## SPATIAL DATA

Spatial data contain the coordinates and identifying information for various map features. Three types of features can be represented in the map:

- points
- lines
- areas.

The various physical aspects of the map — political boundaries, roads, railroads, waterways, and so forth — are organised into layers according to their common features. For example, the collection of points that represent park locations can be organised into a parks layer, the collection of lines that represent streets can be organised into a streets layer, and

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the collection of areas that represent census tracts can be organised into a tracts layer.

A layer can be either static or thematic. Static layers use the same graphical attributes (colour, line width, and so forth) for all features in a layer. Thematic layers can use different graphical attributes to classify the features in the layer. For example, a thematic area layer representing sales regions could use different colours to show the quarterly sales performance of each region. A thematic line layer representing highways could use different line widths to show the classes of roads.

### ATTRIBUTE DATA

The second type of data used in a GIS is attribute data. With most GIS software, data sets or data views can be associated with the map through links to the spatial data. For example, the spatial data might represent a county and contain information for city boundaries, census tract boundaries, streets, and so forth. An attribute data set with population information for each census tract can be linked to a map by the corresponding tract value in the spatial data.

There are two main ways in which the attribute data can be used. These include using variables from the attribute data as themes for layers — for example, an attribute data set containing population data could provide a theme for a map of census tracts — and creating actions that display or manipulate the attribute data when features are selected in the map.

The actions can range from simple ones, such as displaying observations from an attribute data set that relate to features in the map, to complex ones, such as submitting procedures from statistical software to perform statistical or special analyses.

### FUNCTIONALITY

Typical end-user functionality for business users would include the following:

- pan and zoom the map extent
- query spatial and attribute data
- create a buffer around features
- measure distances on the map
- add map notes, such as text, graphics or images, to the map
- make edit notes to map spatial and attribute data
- locate an address
- viewers also feature legend, overview maps, saving and retrieving projects, and map printing.

One of the key concepts with GIS software is selecting features from the map and then performing actions on the attribute data associated with those features. Actions can be defined to:

- display observations from the attribute data sets that relate to the selected map features
- open additional maps that relate to selected map features
- display graphic images that relate to the selected map features
- subset interactively the attribute data sets according to the subset of selected map features
- submit statistical programs for processing subsets of the attribute data that relate to the selected map features.

### BUSINESS APPLICATION OF GIS IN MARKETING

The following section of the paper explores some of the business applications of GIS in a database marketing context.

#### Location information

It is becoming quite common for

organisations, as part of a marketing campaign, to include details of local branches where goods and services can be purchased. In the past this communication may have consisted of:

- the address of the branch
- a standard generic map.

Now with the integration of campaign management and GIS technologies it is possible to provide the customer or prospect with:

- the address of the branch
- a personalised map
- a personalised route guide

of the nearest location providing products or services. This personalisation being based on the customer's home or work address.

### **Neighbourhood marketing**

A number of the direct insurance companies now regularly promote insurance to prospects living in the neighbourhood of an existing customer. Making reference to the benefits that the customer (neighbour) has been able to achieve through the product or services provided by the organisation. In some cases the personal details of the customer are included in the communication (with the customer's permission) to bring the proposition to life. In the past this targeting has been done using postal geography but with the wider availability of detailed street level data this type of marketing is now being targeted using GIS technologies.

### **Targeting using drive time**

As most retailers know, the length of time it takes a customer to drive to a

location can significantly impact the performance of marketing communications aimed at stimulating a customer or prospect to visit a specific location. It is now becoming quite common for organisations to use expected drive times as part of the selection process for inclusion in a campaign.

In some cases these drive times are being used as inputs into behavioural models, which in turn are being used to target communication activities as part of the campaign selection process.

The quality of drive time algorithms has improved over the last few years primarily because of the quality of data available. This is allowing drive times to be refined to take into account time of day and time of year. As anybody who commutes to work will confirm, these factors can have a big impact on how long it takes to get to or from a location.

### **Catchment area analysis**

Perhaps the most common application for GIS systems in marketing is retail catchment area analysis. Information on customers and/or prospects is combined with purchase and spatial data to map out the catchment areas for retail locations.

These catchment area definitions are then used to support a range of marketing activities including:

- customer or prospect profiling
- forecasting branch revenue or potential
- instore space allocation
- defining local merchandise mix
- store categorisation
- campaign selections
- branch network planning or rationalisation
- sale territory planning.

### Geodemographic analysis

The wider availability of census and other attribute data sets has led to the development of a number of advanced geodemographic systems. These systems can be used to classify the people (or households) living or working in a particular area. In many cases these geodemographic codes can easily be attributed to individuals, allowing a range of marketing and analysis activities to be supported.

Their use as inputs into behavioural models has proved very effective where the internal data available on individuals are poor. Even more advanced solutions are likely to be developed in the UK, once the 2001 census data are made available for commercial use.

### Supply and demand side forecasting

A good industry specific application of GIS is provided in the telecommunications sector by supply and demand forecasting. Here information on network capacity by geography is matched against information on demand by geography. The resulting network capacity gaps are used to drive a range of activities. These include:

- targeting localised special discounts
- changes in tariff structures
- promotional activities for local dealers
- special promotional events.

Where there is likely to be excess capacity in the medium term, the information is used for:

- network planning
- dealer recruitment
- retail location planning
- local marketing activities.

External information on businesses is combined with the internal information

on customers in capacity rich areas. GIS is then used to locate target business for sales and marketing activities. External profile data on workforce (in terms of type of employment and method of travel to work) is used to model the potential and rank the prospects within the catchment areas. This allows limited sales resource to be well targeted.

### Location-based marketing

With advances in digital technology, will be seen the increasingly frequent and sophisticated use of location-based marketing. GIS is a core component of this approach to marketing.

Modern cellular communications technology allows the location of the mobile device user to be identified to within 50 feet. This has led to the development of a number of location-based services. One of these is two-way short message services (SMS). This technology allows communications to be sent to an individual based on their physical location. To date the application of this technology has concentrated on information provision, a small number of organisations have started to use this technology for marketing communications. The two-way nature of the technology means that an individual can respond with ease.

Although there are a number of data protection and privacy issues that will need to be addressed, a number of organisations in Europe are running pilot projects where the information is being used to drive marketing communications. If this technology becomes more widespread the application of location-based data may become the norm in some sectors, eg the automotive sector.

Location-based marketing will be important for companies such as retailers, banks or media that want to attract

customers to a physical location, such as a retail store, branch or cinema. For example, if a supermarket chain knows that one of its loyalty card shoppers is in the vicinity of one of its supermarkets, it can send a message telling the shopper about special offers.

## INTEGRATION OF ANALYTICS WITH GIS

As with most aspects of intelligent marketing solutions, analytics will play an important role in the effective use of GIS systems in marketing. Companies will need to analyse customer behaviour and transactions to build up catchment areas for location-specific campaigns. These catchment areas will take into account customers' common routes of travel — home, work, shopping etc. — in order to target customers appropriately. Analysis will be important for predicting patterns of movement. For example, a customer sitting on a train travelling to work could well be in the right place at the right time for an SMS message campaign.

Analytics will also help marketers determine the optimal time at which to issue location-based messages — for example, is it better to target a concert-goer with a promotion when they are on their way to the concert, or when they are actually there?

Marketers need to respect their customers' right to privacy. Even customers who 'opt-in' to receiving communications will not want to be bombarded with irrelevant marketing messages. Accurate information about customers is vital to ensure that customers

receive communications that are of value to them so that they remain opted-in.

Increased automation between analytics and campaign execution will be vital since location-based marketing is not only location specific but also time specific. The rules-based analytical engine selecting customers for particular campaigns must be integrated with the campaign-execution front-end in order to get the message out to the customer while they are still at the location.

## CONCLUSION

GIS technologies will become an important component in enterprise marketing automation solutions, as the need to understand the geographic dimension of marketing become more important. A key driver for this will be the move to using location-based marketing techniques such as those provided through SMS and the technologies following behind. When GIS is integrated with analytics and campaign management the resulting capabilities provide a powerful mechanism for sustaining competitive advantage though location-based marketing.

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