



Electronic Commerce and Geomarketing

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Abstract

This paper details how the latest developments in technology, coupled with the emerging capabilities of the Internet are providing opportunities to allow large geographically related datasets to be made more freely available. These opportunities will change forever how data is provided, accessed and used. The paper discusses the sense in data being made freely available but not necessarily for free. In addition these new technologies will provide for the merging of different datasets to allow analysis which was previously very difficult and sometimes plainly impossible in an easy and low cost environment.

1 Introduction

“GeoMarketing” has traditionally focused on the use of Geographic Information Systems techniques to assist in the tasks of marketing - specifically in the area of market location and segmentation. Thus we have seen increasingly sophisticated use of demographic data to find clusters of attractive prospects, use of complex spatial analysis to assist in the location of facilities, focused promotion to finely controlled areas, and so on.

This paper examines a different marketing problem, that is confronting the owners of many datasets with a geographic dimension; how to gain access to the potential market for the data, and create greater value for their data - thus leading to enhanced business.

2 Changing requirements and opportunities

It has been widely quoted that 80% of all events have a location associated with them, and this is often recorded within computer systems, in the form of an address or other description - or even as a formal spatial co-ordinate set. There are in fact many more geographically based datasets than may be first imagined - for example the UK Government and its agencies have over 580 such datasets, which are potentially available to the public. If one includes the many commercial data providers, the extent and variety of the potentially available data is vast indeed.

However, the use of these datasets is usually limited to small communities of users, and the market is at best static. The potential benefits are not realised. It is essential to examine why this is.

There are a number of reasons that can be readily identified. For example, the very existence of many datasets is unknown outside their small community of specialist users. Potential users who may be interested are not able to identify the benefits. Equally, many datasets are virtually “locked away” in remote locations, thus discouraging casual or exploratory use. In the UK, for example, information on geology is located in Nottingham, information on environmentally sensitive sites is located in Peterborough, a company in Exeter has data on contaminated land, many government statistics are kept in London. Equally, much

data is still stored in paper records - some estimates put the proportion of all data still in paper form as high as 90% - although many data owners have undertaken the long (and expensive) task of conversion to digital form.

Today there are many pressures for change. The former UK government created an initiative known as *Government.direct* in order to facilitate public access to government datasets. These were to be freely available (which does not equate to available for free!). Funding changes are forcing the need for cost recovery on investments made in conversion of the paper records into digital form. Data providers are investigating a number of proposed strategies that will expose their product range to a wider client base, accelerate the provision of data and ultimately create greater revenue streams. Many organisations in the private sector see changing market conditions, with new competitors enjoying significant advantages. For example, the banks have seen large retailers begin to offer banking services, and small real estate companies see the banks and retailers as strong new competitors.

However, the biggest change of all is in the earliest stages of its effects. The Internet offers the ability to provide access to the market in the most direct and pervasive manner ever imagined. As the Internet matures in to Electronic Commerce, with associated secure payment mechanisms, it offers owners of products - especially information products - a new marketing model of how to do business. The potential markets are enormous, potentially world-wide, and the channel to access these markets is cheap, direct and common across markets. The downsides of Internet use include the way that it runs counter to many other current marketing strategies, which focus on finer segmentation and carefully targeted offers. The Internet, by its very nature, is a largely undifferentiated medium, dominated by customer “pull”, although the emergence of “push” technologies provides an interesting counterweight. It is also difficult to use when large amounts of data are to be transferred, as there is a perennial problem of bandwidth which makes transfers slow.

Equally, it is only recently that products offering the ability to access, use and display spatial data have become commercially available. Even today, many such products use

raster technology which implies greater data volumes to be transferred, and offer limited interaction with the map.

Finally, for the Internet to be an electronic commerce medium, the ability to conduct secure transactions without compromising sensitive data such as credit card numbers is absolutely essential. Already, there have been sufficient scare stories to make most organisations and individuals wary.

3 Some recent developments

Intergraph(UK) has been at the forefront of working with our customers to assist them in exploiting the changes outlined above. There are a number of developments, some of a prototype nature, and some already being used as a commercial venture.

3.1 Satellite delivery

One of the first projects in which we became involved was directed at the problem of the transfer and use of large amounts of data. Under the Multimedia Programme of the Department of Trade and Industry (a government department), and in conjunction with ESYS, a specialist satellite communication company, a successful pilot project was created to show the potential for the delivery of spatial data via a satellite. Information delivery today has well understood cost/speed trade-offs, with an ISDN line offering up to 50 times the performance of a modem link, but at 10-20 times the cost to deliver a 100 KB file. However, the bandwidth is only required in one direction, as sending requests and queries consumes little bandwidth, but large file downloads take much bandwidth. The pilot system was asymmetric in the sense that requests for information are sent via normal means over the Internet. During the project, modem connections up to 33.6 Kbps were tried, but the system performance was not overly sensitive to changes in this link. However, responses from the server are sent via a satellite uplink to a communications satellite and then down to the user via a 60 cm receiving dish. The speed of transfer possible is very high - to the point at which data is delivered at comparable rates to transfers from a local hard disk drive. This type of service is becoming more economically viable as equipment costs fall.

3.2 Information broking

We have also established a commercial Internet service to market geographically based datasets. Here Intergraph manages the system, and acts as an information broker. Owners of datasets can use this service to broaden their market access, and users can identify, browse, correlate and purchase relevant data. Intergraph makes money from the data sold, rather than from traditional product sales.

The first service established was to provide data on borehole samples which the British Geological Survey have taken throughout the UK. A borehole record is an item of text or graphics describing the subsurface material recovered at a site as a result of drilling a borehole. This service will

supply copies of original borehole records held by BGS within its National Geological Records Centre.

BGS holds records in excess of 500,000 boreholes which have been drilled for a wide range of purposes and include: shallow drilling for site investigations; mineral exploration; water extraction; hydrocarbon exploration; geothermal energy and monitoring. The records have been deposited as a result of active collecting, statutory legislation, exchange agreements and voluntary donations. They range in length from site investigation boreholes of around 2 m for civil engineering purposes to stratigraphic boreholes of over 3 km. This information can be of critical importance in land use development decisions and has assumed greater importance in recent years as changing weather patterns have effects on land stability.

This service will allow selection of a geographic area and the viewing of metadata details about specific boreholes from a database of over 500,000 records. You may select the boreholes you have identified and place those items into your shopping basket, confirm your selection and complete the order form. Prices for each record selected will be displayed on checkout. In the initial release, information is despatched and payment made by traditional methods, but the second release extends this on-line data provision and secure electronic transaction for payment via credit card.

The second service has now been added, which provides access to environmentally sensitive site information - SSSIs (Sites of Special Scientific Interest), which is owned by English Nature. These sites carry development restrictions, which vary depending on the reasons the site was listed - for example, rare wildlife or archaeological interest. Customers can see the location of sites, but need to purchase the precise boundary definition and information on the restrictions.

Users of the service will be able to buy a full background map of their area of interest, and correlate different datasets, thus extra levels of added value.

More datasets will be brought into the service over time. Already interest has been expressed by municipalities who could provide local land use planning information, economic development data, and tourism data, as well as commercial firms who can see the marketing advantage provided by this service.

Of particular interest is the signing of a contract between Intergraph (UK) and the National Association of Estate Agents, who represent the great majority of real estate agents. The intention is to create a national Internet based service to sell properties, which will use geography as a key factor, with the intention that this would be extended to show details of local schools and shopping, local medical facilities, etc.

This allows the typical small real estate agent to compete effectively against national chains and new large entrants in their market, such as retailers or banks through the use of technology based geomarketing.

4 The Impact of geomarketing

It is worth examining the impact these geomarketing developments have already had on the marketing strategy of the organisations with which we are working. In terms of classic marketing theory, we have already seen effects on all four "P's" - Product, Price, Place, Promotion.

There have already been *Product* changes, in that the deliverable has become smaller in terms of extent. For example one of our partners used to sell their data only as a national dataset. This has been progressively broken down, first to Counties, and now to single items. We are beginning to see datasets and services bundled together as added value is created by the new marketing model.

Pricing has been moved from a model based on low volume sales with high administrative overheads, to a model based on much higher sales and much simpler administration. This in itself reinforces the willingness of users to explore data and buy speculatively. However, for the great majority of users, price is not the key barrier, as the value of the information is very high if its use prevents mistaken investment decisions.

Place or channel is the key change. Previously it was very difficult to access these datasets, as noted earlier. By making access direct and simple, and adding value in the channel,

the use of the data becomes a much more attractive business proposition.

These services offer immediate access to the data from the customers office or home.

Promotion is changed in that the existence of the data is much more widely recognised, as it is advertised in Internet search engines and through hot links from related Web sites. It is also in the strong self interest of the information broker (Intergraph) to promote the service, as our revenues depend on use of the services.

5 Conclusion

Geographically based information is an important resource which has been of limited use historically, for a variety of reasons. With the advent of cheap, pervasive distribution channels exemplified by the Internet, and the associated technology to exploit the information in these channels, such as Intergraph's GeoMedia Web Map, the entire business model has been revolutionised for the owners of the data. They are now seeing new markets opening for their product, and greater revenues flowing from their products, which in turn can be invested in developing their products for this new market, thus creating further growth.

Truly, a virtuous circle!

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