

The Globalisation of Business Geographics

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What are business geographics?

The label **business geographics** was coined, I believe, by Denny Parker, founder publisher of GIS World, who launched a successful conference under this banner in the United States at the beginning of this decade. The term resonated with many people, who saw tremendous potential in the technologies being developed by the GIS community, but who were put off by the technological barriers to entry raised by the high priests of Geographical Information Systems. Typical questions asked and answered by business people are:

- Who are my customers?
- Where do they live?
- Who else lives in that neighbourhood?
- What else do I know about people living in that neighbourhood?
- Are my factories/distribution centres/shops appropriately located in relation to the distribution of my customers?
- Where are there other similar neighbourhoods, with people who are not yet my customers?
- Where should I invest in new factories/distribution centres/shops?
- Where are my competitors locating their factories/distribution centres/shops?

Few marketing and investment decisions are made today without detailed demographic analysis; and the industry that has grown up to answer these questions is far larger than the traditional GIS industry. Such users of spatial data are more interested in measuring the time it takes to drive from **a** to **b** than they are in measuring the distance.

Is it appropriate to be talking about business geographics to a conference largely attended by representatives of national mapping agencies? In the UK, Ordnance Survey has by and large ignored the growth of business geographics, based on relatively small scale and highly generalised mapping, and although there are signs of a change of mind, it could be another case of too little, too late.

However, business people are not just asking these questions with respect to one country. Global corporations are asking global questions. They would like to be able to compare neighbourhoods in Spain and Mexico, England and Germany, Australia and Canada, Japan and Switzerland.

This paper is designed to set you thinking. Do business geographics have anything to do with the traditional business of a national mapping agency? Does the growth of business geographics threaten the future of the national mapping agencies? Will it make any difference if you simply do nothing? Can you make a collective decision to prevent the globalisation of business geographics? Are there ways in which national mapping agencies ought to be working together to deliver global data sets?

With respect to a collective option to prevent the globalisation of business geographics, by simply refusing to supply the data, I was asked by the head of a national mapping agency if I had heard of King Canute, one of the many Danish kings who ruled Britain more than 1,000 years ago. 'Oh, yes,' I said, 'Wasn't he the chap who tried to stop the tide coming in by seating his throne on the shore and ordering the waves to be still?' 'Right chap, wrong interpretation. The king was well aware of the situation, but was demonstrating to his courtiers the very real limits to his power. I have to work a similar trick with my staff.' The commoditisation of small-scale digital mapping across Europe is now irreversible.

It's not GIS!

My first experience of the world of geographical information came in 1991, when Vanessa Lawrence, now with Autodesk, but then a book publisher working for Longman, involved me and David Rhind, then a professor at Birkbeck College, London, in a scheme to build a national address gazetteer. This never happened, but I well remember that they both used the put-down 'But that's not GIS', when I referred approvingly to Autoroute, then a relatively novel software product.

I didn't care if it was or wasn't GIS. That seemed like a theological issue rather than a practical one, and I was quite pleased when Denny Parker invented the **business geographics** label. Soon thereafter, I met Tony Buxton, founder and proprietor of Tactician, who shunned the term GIS and wouldn't go near a GIS conference or exhibition. For many business people, GIS was a technological mirage, a black hole into which money disappeared to no useful purpose. Tactician was a sales management tool, which incorporated maps.

The aversion of business people to GIS remains a concern of GIS booster groups, who are always looking for case studies to demonstrate the economic value of their technology. Most of the people who are building real businesses and making real money around geographical information are happy to agree that what they do 'isn't GIS'. Nevertheless, business geographics uses techniques that were originally crafted in GIS laboratories around the world. The New York Times recently described GIS as 'an obscure branch of computer science' – a description that really should shame us all.

In fact, most people recognise that the term GIS is now all but obsolete. It no longer describes all the different things that people do with spatially organised information in computers. I like the term **business geographics** because it speaks to my concerns.

Addresses

Most businesses, even those who never give a conscious thought to geography, actually hold a great deal of address-based data, related to their customers, their suppliers, their own establishments and their staff. This is where **business geographics** begins. It would be nice, wouldn't it, if all addresses were linked unambiguously and uniquely to a single location. Anyone, who has worked with address-based data knows that in this country at least, we are a long way from this happy state of affairs.

Postal geographies

Postcodes and zip codes are used to link and classify groups of addresses. In the United Kingdom at least, the postal geography is constructed by Royal Mail for the sole purpose of delivering the mail. It does not, and will not, alter the postcode and address system in any way to meet the requirements of data collection or administration beyond its own remit. Royal Mail works with Office of National Statistics to maintain the POSTZON file, which relates mail delivery points to electoral wards and to NHS areas. However Royal Mail will not undertake to ensure that any level of the postcode system does not cross administrative or statistical boundaries. It also reserves the right to allocate, re-allocate and cancel postcodes, without reference to any other authority, whenever necessary to meet operational requirements. The position may well be different in other countries, and I do not pretend to be an authority, but in this country at least, we have a system of geographic referencing that operates quite independently of other administrative or statistical boundaries. One other important characteristic of postal geographies is that those who use them are generally quite uninterested in the detailed topography of the areas delineated by the postcode boundaries.

Administrative boundaries

Administrative boundaries are of vital importance to business people, the emergency services, to national and local government, and to the office of national statistics, but they all use them in different ways. From the perspective of business geographics, it is a simple matter of topology. Does a building fall in this jurisdiction or that?

TIGER files

Many people attribute the explosive growth of business geographics in the United States to the existence of the TIGER (Topologically Integrated Geographic Encoding and Referencing) files, which were originally assembled by the US Bureau of Census at great expense during the 1980s, by combining USGS road declinations, hydrography and boundaries with census address and boundary attribute data. Although the digital map data quality does not bear comparison with, for example, Ordnance Survey, data in terms of resolution and referenced information, TIGER represents a complete and flexible geographical referencing system. Its central feature is a map browser which allows a range of display attributes to be specified interactively. These include coverage area (determined by centre point coordinates), scale, and image output size, in addition to a series of menus offering a choice of layers to be displayed and the option of creating a thematic choropleth map based on 1990 Census statistical data. It is claimed that the entire US is covered at street-level detail, but in some rural areas this proves not to be the case. However, the algorithms governing aspects of cartographic design such as line styles and labels with respect to arbitrary scale result in good, clear cartography. Town, village and street address labelling are still quite poor but apparently improvements are in the pipeline. Markers and additional labels can be added as a separate layer (there is a choice of symbols but, as yet, no control over font). There are a number of other worthwhile features, including a gazetteer of US place names and a legend facility. To all intents and purposes, the TIGER files are freely available and form a framework for business geographics in the United States. An industry has grown up around them. One question that has been raised, notably by the head of the Portuguese national mapping agency, is whether it would not be worth constructing and maintaining a similar data set for Europe?

Demographics

Census data, collected every ten years, by the Office of National Statistics, used to be the principal source of data that enabled business people to answer some of the questions they asked about their customers: Who else lives in that neighbourhood? What do we know about them? Poor coordination between offices of national statistics and the national mapping agencies mean that these questions are increasingly answered in other ways, through analysis of data collected through lifestyle questionnaires, loyalty cards, purchasing patterns, use of credit cards, car ownership and so on. Business geographics are less dependent than ever before on census data.

Small area statistics

A project was launched in 1993, under the auspices of the European Union, DGXIII, to deliver Small Area Statistics for the whole of Europe, EURIPIDES, down to NUTS5 (wards in the United Kingdom, municipalities in Spain). Appropriate software was developed, together with a methodology, but the project ultimately foundered on the unwillingness or inability of the Offices of National Statistics to deliver a Europe wide product at a price that the market would pay. Only the United Kingdom, Belgium, Ireland and Norway were willing to cooperate fully. I don't intend to get into a lengthy argument about cost recovery and appropriate pricing beyond saying that current pricing policies imposed by mapping agencies and statistical office are a major obstacle to market growth, to product development, and to the efficient use of geographic data across both private and public sectors. One potentially useful product of EURIPIDES was a Europe-wide set of administrative boundaries, down to NUTS5, produced by MEGRIN – SABE. This could still be the foundation stone of a much more ambitious initiative. However, at around 8,000 ecu, the sales price is still 10 – 100 times that which would be required to achieve high volume sales.

Microsoft's strategy

Introduction

In April 1998, Dr Robert Barr offered a beguiling fantasy in one of his Dangling Segment columns in GIS Europe, set a few years in the future, in which he saw a thinly disguised Microsoft, headed by a thinly disguised Bill Gates, delivering a map of Europe that was wholly unencumbered by third-party intellectual property rights. You may quarrel with the details, but many of the trends described in this article are already visible.

Microsoft's most ambitious move yet is the launch of MapPoint, the latest addition to the Microsoft suite. It was launched this month (June 1999) as part of Office 2000 for the United States. The UK version appears in August and other European countries will not be far behind.

This is likely to revolutionise business geographics, vesting them with the ubiquity of the spreadsheet and the word processor. Add-on packages are already appearing in the United States, extending the functionality of the basic Microsoft package, which is retailing at \$109. I do not believe that rival low-end desk-top mapping packages can long survive this assault from Redmond.

The core of the development team implementing MapPoint came to Microsoft in 1994 with the acquisition of British-based Automap. Ian Mercer was head of Automap; he now leads MapPoint development. One might expect that Microsoft would have substantially staffed the programming team with people from the GIS software development industry. However, only one team member, Dan Cory, who was part of ESRI's ArcView 2 effort, comes from that arena.

Why has Microsoft turned its attention to this 'obscure branch of computer science'? To those who say that Bill Gates wants to control everything, indiscriminately, one has only to point at computer assisted design, a seemingly larger market that Microsoft has ignored. Dr Barr's plausible explanation is that geography is central to Microsoft's e-commerce strategy. This explanation is borne out to a large extent if one visits Microsoft's Expedia site (www.expedia.com), with street maps of the whole of the United States. This site offers free information, carries advertising, and sells travel.

The GIS world in Europe has paid little attention to Microsoft and its plans, because 'It's not GIS;' It doesn't fly the GIS flag. Unfortunately for the paladins of GIS, Microsoft is better placed than them to deliver what most of the punters want. MapPoint joins Expedia, Streets 98, Trip Planner 98, Encarta 98, and Terraserver.

Furthermore, Microsoft has learned – or invented – the most important principles of the IT revolution. No one gets it right first time round. You make a statement. You occupy market space at some (previously) unthinkable low price point. You generate interest and sales, and then gradually through several iterations, you deliver what you promised in the first place. This is the story of MS Windows.

It was also the story of Apple Computers in the late 1970s and early 80s, the story of AutoCAD in the early 1980s, and the story of the Internet, over and over again. Microsoft is aiming to achieve the same result with maps as in other fields already conquered. You heard it here first. Within five years, Microsoft will dominate the desktop small-scale mapping market as completely as they already dominate word processing and spreadsheets. Alternatives will exist, but who will use them?

Look, for example, at www.terraserver.com, which allows you to view aerial and satellite images of the earth's surface. The pictures are old, coverage is extremely spotty, and resolution is poor, but none of that matters. Extravagant claims are made by Microsoft and are dutifully echoed by the press. If you have never before seen good quality images on a high performance workstation, Terraserver is impressive; and, 'Hey, it's free, on the Internet. What are you complaining about?'

In ten years' time, broadband connections will be in place, satellite images with improved resolution will be widely available and much, much cheaper. At that point, www.terraserver.com will come into its own. It will be the place to go for readily available, low-cost images. So long as Microsoft occupies that market space, it will be difficult if not impossible for anyone else to get a look in.

The interesting thing about Microsoft MapPoint is that MapPoint is likely to offer in Europe, nation by nation, the framework product that the TIGER files delivered in the United States. This will be achieved because Microsoft is large enough and rich enough to pick off the national mapping agencies one by one. It will create a market space that the rest of us will simply crowd into.

In designing MapPoint, Microsoft's approach differed radically from that heretofore pursued by the GIS industry. According to company officials, the product was built 'up from the bottom'. Instead of looking at heavy-duty GIS or desktop mapping systems and deciding what to 'leave out', Microsoft used its focus group data to develop a product whose features and benefits flowed upward from the Office user's requirements. Consequently, the resulting product is unusual and in many ways, it is a radical departure from 'traditional' desktop mapping products. MapPoint is an unabashedly 'closed' system, geographically; no maps can be added. While this may seem strange at first, it allows Microsoft to remove all layer handling from the hands of the user. While MapPoint 2000 is 'closed' mapwise, it is extraordinarily 'open' with respect to tabular data. Loading data – especially from MS Office applications – is a well-executed and powerful feature.

This latter feature is what makes this product an ideal vehicle for delivering a European framework map, together with associated gazetteers, in a way that should protect the commercial interests of the national mapping agencies.

The role of national mapping agencies

I now want to turn my attention to the national mapping agencies. What is their role to be in this brave new world? Will they be: Enablers or blockers? Partners or competitors? Winners or losers?

Enablers or blockers

In general, I see the national mapping agencies collectively – including Ordnance Survey – as having acted as a brake on the kind of private sector development that created the business geographics market in the United States. I say that quite neutrally, recognising that those making the decisions may have valid local reasons for the constraints they place on the use of their mapping. The constraints are not confined to price. There are well-known technical problems and jurisdictional problems, which make TIGER files for Europe an unlikely prospect. However, taking a 10 – 15 year view, I think it is absolutely certain that we will have cheaply available street-level mapping for virtually the whole of Europe, costing no more than similar maps already cost for the whole of the United States. This mapping will also contain administrative boundaries, and be linked to gazetteers that will allow the user to locate individual buildings within a particular administrative area. How can I be so certain? The benefits to both business and the public administration are so great that the countries that choose to go down this road early will soon be followed by the rest. The quality of the mapping will vary across Europe, but in the world of business geographics, topographical accuracy comes a long way down the list of priorities. One of the greatest obstacles to better use of geographical information that is not of the national mapping agencies' making is the need to bring together data from a number of different agencies. This requires close cooperation among government agencies and the production of new framework data sets that bring together administrative, social and environmental geographies. These framework data sets need to be made generally available at the kind of prices that prevail in the United States. It is still an open question whether this will be done by the public sector or the private sector. Much as it grieves me to act as a booster for Bill Gates, Microsoft MapPoint offers a clear way forward.

Partners or competitors

This is a crucial issue. I can speak only of the United Kingdom, where at present, Ordnance Survey is both a partner, as supplier of data, and a competitor, as producer of product, with companies operating in the private sector. This may have been tolerable in a world of paper maps, with the consumer choosing between an OS map and a Bartholomews map, but cannot endure in a digital world. In the short term, all the competitive advantage may lie with the national mapping agencies, but in the medium to long term, over the next ten to fifteen years, the balance will shift in favour of global suppliers for the reasons set out above. My hope, as a value added reseller of Ordnance Survey data, is that we can find an acceptable division of labour that allows both national mapping agencies and the private sector information publishing industry to thrive and prosper.

Topology vs topography

Maps have a part to play in the application of business geographics, but only a part. You can sort addresses by their post codes, and provide a social description of the inhabitants of a particular neighbourhood, without ever referring to a map. Similarly, you can segment a mailing list, according to the tax structure of a particular region, without looking at a map. For a great deal of retail analysis, drive times are more important than distances. In other words, topology is more significant than topography. This creates a substantial problem for the staff of national mapping agencies. They have been trained as surveyors and cartographers, accustomed to judge the quality of a product by these standards. The products offered for business geographics by Ordnance Survey, for example, are generally degraded by-products of high quality topographic databases, not designed from the ground up to meet the specific needs of business users. Detailed topographic mapping will remain important for many military and civil engineering applications, so it cannot be simply forgotten, but the great growth in demand involves a completely different approach. For one thing, it requires closer cooperation with other agencies of central government and local government than has so far been feasible. It also requires close cooperation with the private sector. As Dr. Geoffrey Robinson, Director General of Ordnance Survey, has pointed out on a number of occasions, a topographic map is not only a rich source of information, it is also potentially a unique distribution channel for data produced by a wide variety of different players in both private and public sectors. Indeed, my own company, Landmark was built around that proposition. Large scale digital mapping was the perfect medium for integrating and distributing environmental data from a wide variety of different sources.

Conclusion

Business geographics has already broken out of the GIS laager and will have a greater impact on ordinary computer users' consciousness over the next five years than GIS has had over the past twenty years. This is a tremendous opportunity for all of us involved in mapping to rethink our priorities, to consider how we can use this widening of the horizon to educate people to the value and power of mapping and to build clear and robust links between what the national mapping agencies do, and what Microsoft's customers want. What I have had to say refers mostly to Europe, but Asia and Africa will not be far behind and the United States is already there.

