Introduction

THE EDITORS

What can managers use GIS to achieve? Any attempt to answer this question would generate a list of infinite length. Here it is tackled through three case studies, chosen to illustrate the development of business and service applications of GIS which, as Maguire (Chapter 25) also comments in the introduction to the Applications Part of this volume, represents one of the major growth areas of GIS usage. Geographical information represents both a strategic and operational resource for a wide range of business and service organisations, and in many countries (notably the USA) a vast industry of 'value added resellers' (VARs) has grown up to service the needs of advanced information economies. Business and service organisations utilise such data products within GIS for a range of strategic and operational requirements, such as site and market area analysis, sales planning, market research, direct mailing, door-to-door leaflet campaigns, and planning for public services (see Shiffer, Chapter 52).

The term 'geodemographics' has come to be used as a label for small-area typologies derived from population census data that have been shown to exhibit an identifiable correspondence with geographical patterning in consumer behaviour. They remain the most commonly used data products in business information management, having developed out of pre-1960s academic research into geographical techniques for producing summary measures of small area variability in social, economic, and demographic conditions.

Yet recurrent problems with use of census information in such applications have included the outdatedness of infrequent (usually decennial) information, the strictures of data aggregation into (possibly heterogeneous) areas, and the need to rely upon imperfect surrogate data in the absence of variables which bear the most direct relationship with observed consumer behaviour – notably (in most countries) income. Add to these the data pricing policies of some national census agencies and it is possible to understand the recent impetus towards supplementation and/or replacement of census and conventional geodemographic classifications with so-called 'lifestyles' classifications. These are based upon customer surveys, guarantee card returns, and store loyalty programmes. One problem with such sources is that it is not possible precisely to quantify the degree to which they are representative of general populations, and this inevitably restricts their usefulness in many business and service applications. Goodchild and Longley (Chapter 40) discuss this problem in the context of the established scientific basis to geographical data collection.

The first case study in this Section is by Mark Birkin, Graham Clarke, and Martin Clarke (Chapter 51). This is based on their extensive experience within the GMAP firm in Leeds where they have exploited commercially the modelling and spatial analytical techniques they and their colleagues have devised over two decades of academic research (see also Getis, Chapter 16). They show how it is possible to predict important aspects of consumer behaviour. This has great attractions for car manufacturers and other multiple outlet retailers which are continually faced with closing down shops, opening new ones, and investing in improvements to others, taking into account the interactions with other outlets as well as the likely effect on revenues in any one shop. They show that the techniques used in many existing GIS are crude and unreliable but that

considerable improvements can be wrought. It is, however, fair to observe that their approach to geospatial data management lies at the most sophisticated and expensive end of the spectrum of business and service planning applications – that is, they are strong advocates of a consultancy-based approach to problem-solving, in which specialised skills are purchased in order to solve strategic as well as operational management problems. Other, usually more mundane but more numerous, business and service applications are developing at the low-cost end of the market, based upon the break-up of GIS software into task-specific desktop systems (Elshaw Thrall and Thrall, Chapter 23) and the movement of GIS vendors into provision of shrink-wrapped limited functionality systems complete with applications data (Batty, Chapter 21).

In Chapter 52 Michael Shiffer's perspective upon decision-making in urban planning sees it as a key process in democratic societies: he argues that there is an important interface between democracy and operational management and that this, as such, reflects the operations of the state in microcosm. It is also becoming increasingly important as local communities come to assert their interests and values against those of officialdom or big business. Central to this interplay of interests is discourse between different parties. Management of planning is therefore a non-linear operation without line managers in any conventional business sense. His chapter describes how combinations of GIS and multimedia can facilitate the active involvement of many different groups in the discussion and management of urban change through planning. It deals with different components of public discourse, notably debate and consensus-building, and with communications between parties sometimes separated by space and time. Shiffer's own experiments clearly demonstrate the practical possibilities and difficulties in the use of these technologies in the planning context.

Governments operate at multiple levels and necessarily embody many of the characteristics of both business management and the democratic, consensual decision-making described in the two earlier chapters. There has been a number of descriptions in the past of how GIS has successfully (or, more rarely, unsuccessfully) supported individual functions in local government. Applications where it operates across the entire range of governmental functions – especially at national or regional level – are, however, very rare. This is not surprising for the complexities of multiple interacting policies, politicised debate, and numerous public and private sector players with sometimes conflicting agendas typify such environments. There is rarely a 'best' answer – and, even if there is, it is unlikely to be thrown up by simplistic spatial analysis generated by a mechanical system. Yet Jane Smith Patterson and Karen Siderelis (Chapter 53) show that GIS can be involved successfully throughout many of the activities of a major governmental organisation, threading through and being influenced by other policies and operations of that government. The State of North Carolina has had strong information technology-based development policies for over 20 years. The North Carolina Information Infrastructure policy is intertwined closely with the State's economic development policies, and both involve public/private sector partnerships. Much of this policy development has a geographical dimension. GIS has played an important role in the development of strategies, the assessment of development options, and the implementation of the strategies: it is a widely used part of the central information infrastructure. The success of these strategies is demonstrated by the substantial inflow of foreign investment into North Carolina, its very low levels of unemployment, and the transformation of its economy from one based largely on primary industries (notably tobacco) to a much more diversified, thriving, and entrepreneurial one.