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The Role of Geodemographics in Segmenting and Targeting Consumer Markets: A Delphi Study

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Introduction
The centrality of market segmentation to marketing theory and practice continues to encourage research and development in better systems and classifications. First developed in the UK for public sector use, geodemographic classification systems provided the starting-point for one of the biggest steps forward in consumer segmentation. From these early forays the market analysis industry was born. In 1977, CACI became the first company to offer a geodemographic targeting system in the UK. CACI developed their UK ACORN (A Classification of Residential Neighbourhoods) which offers three levels of targeting addresses, with six major groups which can be subdivided into 17 and then further into 54 neighbourhood types. Although the USA has continued to provide a lead in some aspects of census analysis[1], this article will focus on the leading developments within the UK market.

As the UK market analysis industry has grown, new products have been developed and new markets established. Systems now available include MOSAIC (CCN), SUPERPROFILES (CDMS), FINPIN and PIN (Pinpoint Identification Neighbourhood) (since this article was written CACI have taken over the FINPIN and PIN classifications; FINPIN is to continue to be marketed but under a different name, while PIN will no longer be generally available) and DEFINE (Infolink). There are other systems and suppliers[2] but these represent the most important “off-the-peg” systems. By way of illustration in the article, we will focus initially on the use of one geodemographic classification ACORN, which has been the industry leader for many years.

ACORN’s increased importance is demonstrated by the growth in the application to key areas of market analysis and decision making. These include segmentation, customer profiling, branch location analysis, credit scoring, direct marketing, sampling[3], demand forecasting[4] and media selection[5].

The main purpose of this article is to examine what the future holds for this most quintessential of marketing industries. Having reviewed briefly the main
benefits and limitations of existing systems, results from a Delphi study of industry experts are presented. These provide insights into the factors affecting future developments, opportunities for linking existing databases and market potentials in various sectors.

The Importance of Geodemographic Classifications

Main Benefits

One of the major strengths of geodemographics is the ability to link together different data sets, provided that these have been geocoded. The UK is well served by large-scale, syndicated surveys such as TGI (Target Group Index), FRS (Financial Research Services), MFS (MORI Financial Services) and the National Readership Survey. For grocery and toiletries markets, Superpanel from AGB or Homescan from Nielsen can be used. In clothing and footwear, TMS is a major provider of data; in electrical, home improvements and in DIY there is Home Audit from GfK.

A standard procedure is to profile geodemographically existing customers on the database with a view to being able to identify those ACORN groups most likely to purchase the company’s products. This type of procedure is useful for branch location analysis[6-8]. Many public and private sector services are provided through a country-wide branch network and have a need to know what type of customer is in their catchment area. Branch location analysis, however, should not be interpreted narrowly as selecting sites for new branches or closing existing ones; there are also merchandise mix, advertising and logistical decisions. Knowing how many of a certain customer type are within the branch catchment area also allows more accurate assessments of alternative branch locations and market and sales targets.

The second advantage of customer profiling is to use the profile to generate new business using direct mail[6,9]. All geodemographic companies can provide a mailing list of hundreds of thousands of the geodemographic groups most likely to buy a specific product. “Spectra”, a system created by CACI for this purpose, generates a formula for targeting which is based either on proven customer attributes or on the results of a test mailing. There are basically two stages: an expanded customer-profiling system, using the addresses of past respondents to identify the discriminators which most influence response; second, a prospect-scoring system, which contains these discriminators to predict the potential responsiveness of any address to future mailings.

One of the other main areas where geodemographic techniques help management control is in credit scoring. Four different types of data are usually integrated in some way to develop a credit-scoring system: county court judgments and satisfactions; individual households’ personal and financial details from the credit application form; payment histories from other finance houses, retailers, credit card companies, etc., and socio-economic and demographic household data from the census[6,10].

The area of media selection has used geodemographics to increase precision. Although now used to select TV audiences for BARB (Broadcast as Audience Research Bureau), the process can be applied to all other forms of media.
Research Board), geodemographics are used less for national media selection and more for local and regional press, since the national media are covered by the single-source survey, TGI.

Geodemographics have also made a major contribution to improving survey design and sampling[11,12]. An area-based classification which can be linked to other survey data is a very powerful tool in the hands of a designer of samples. They can be used to create matched samples or sub-samples; they are also useful in probability sampling, hall-testing and minority product sampling[11]. Cornish and Denny[13] discuss how geodemographics have improved sample designs in readership surveys. Geodemographic classifications have also been used in planning applications by local authorities[14].

To summarize, the main strengths of geodemographics are:
- ability to link different data sets which have been geo-coded;
- coverage of all addresses;
- “multifaceted” nature, not relying on one-dimensional classifiers;
- ease of use, being linked to the postcode system;
- ability to link “above the line” and “below the line” marketing activities together, e.g. BARB and door-to-door promotions[5].

Some Problems
One weakness of geodemographics arises through being a neighbourhood classification and not an individual or household classification. As a result, it is not particularly good at age targeting. To compensate, a household classification system developed by CACI is a way of adding an age dimension to ACORN. It is based on the idea that names are linked to age group. By analysing all the names on the electoral roll, CACI identified 13,000 different first names which could be classified by age and sex. The product’s name is MONICA and provides enhanced targeting power over the standard ACORN. CCN has a similar system called STAGE. CCN’s MOSAIC also contains information at the postcode level. This information includes postal address file information, county court judgments and credit applications among others.

More in-depth analysis can now be made at the household level, since the Government have agreed to release a sample of anonymous records from the 1991 census to the ESRC. This comprises a 2 per cent sample of individuals in household and commercial establishments and a 1 per cent sample of households and all individuals in these households, being disseminated by a special Census Microdata Unit at Manchester University.

A further problem with geodemographic classifications can be the age of the data on which they are based. The 1981 census, which formed the basis of most classifiers, was used until early 1993 when the full 1991 census data became available. The MOSAIC system overcomes this problem in part by including 56 per cent non-census information, which is updated regularly, although the codes themselves are updated only every two years. There are moves to conduct a
1996 census. The last 10 per cent sample census was held in 1966 with the 1976 and 1986 both being cancelled by the Government of the day. If it goes ahead, it will make a major inroad into the problem of out-of-date census data.

A final weakness of geodemographic classifications is that they can give information only on a household’s probability of purchasing and not whether the household has actually purchased. PERSONA, from CCN, is the first behavioural targeting system in the UK. Developed from the CMT National Shoppers Survey, it divides UK households into distinct types. If in geodemographic terms “you are where you live”, with PERSONA “you are what you do”!

Having established the widespread use and importance of geodemographics, the questions about factors which may affect its future development remain largely unanswered. Such factors include: the release of the 1991 census data, the Single Market, advances in computer technology, Government-sponsored GIS (Geographical Information Systems) Initiatives, Pinpoint’s address code system, database modelling, expert systems and bespoke classifications[15,16].

Methodology
In order to assess the importance of the factors affecting the future of the market analysis industry a Delphi study was conducted. A judgemental forecasting technique was considered appropriate because most methods of forecasting rely on historical data. In a relatively new industry, such as the market analysis industry, historical data are severely limited and very often less precise. The degree of product innovation and change, characteristics of new industries, also compounds this problem. More so than perhaps at any other time, new industries are subject to forces which are not easily quantifiable[17]. Delphi has been shown to be superior to some other methods of group judgement techniques, e.g. conference groups[18] and comparable with other methods, e.g. social judgemental analysis[19].

Delphi has certain practical advantages which make it particularly useful. It can be used when the number of parties exceeds the number with which it is possible to conduct meaningful face-to-face discussion. It overcomes the time and cost problems which may prevent panellists from meeting at a single place and time. This is particularly important, since trying to arrange for all the leading competitors to come together in one room and discuss the future of the industry would be difficult. The anonymity of the Delphi responses helps to reassure competitors that the individual information they give will not be seen by their competitors.

The Panel
Crucial to a successful Delphi is the choice of expert. This was based on several criteria. First, names of prominent industry figures were noted from a review of the industry literature. Second, the panellists had to have been connected with the industry for at least five years. Third, respondents which satisfied the first two criteria were then asked to suggest names of people in the industry they
considered should be on the panel. Final panel members had to be suggested by at least half of the initial panel members before finally being accepted. All the companies involved in the industry were contacted, as well as several not-for-profit organizations which have a high level of involvement or experience in the industry, e.g., Government and university departments. No panellist refused to join the panel, so problems of non-response bias were eliminated.

One major problem for the Delphi researcher is high panel attrition. Many respondents find the exercise more burdensome than anticipated. A high rate of panel attrition may in part be due to the fact that the expert feels under-utilized and so defrauded. The provision of anonymity, so central to the Delphi method, is the major culprit here, because it tolerates lack of commitment. Steps taken to increase panellists’ commitment included:

1. face-to-face interviews with the majority of panellists prior to the Delphi;
2. the inclusion of open-ended questions in initial rounds of the questionnaire, the results from which were fed back in subsequent rounds;
3. personal telephone reminders to return the questionnaires.

As a result of these efforts only one panellist dropped out after the first round and another after the second. The modification of the Delphi process used here, which establishes an initial list of events that have been constructed through a series of interviews prior to beginning the Delphi, is called SEER (System for Event Evaluation and Review). The size of the panel may be as large as time and money considerations will permit, but should be no less than eight to ten members[20]. In this study, the number of qualified experts totalled 15. Clearly, the panel did not contain all those who have experience of geodemographics and the results should therefore be viewed as indicative rather than definitive.

The Delphi Questionnaire

The questionnaire was developed from information gained during the face-to-face interviews and literature sources. Since the clarity of each question can affect the reliability of the results, compound events were avoided, as were ambiguous statements. Although full piloting is the best way of assuring this, unfortunately, as Sackman and others have pointed out, this is not standard procedure[21-23]. The questionnaire used in this study was in fact piloted with three of the panel members, as well as other academics who had used Delphi. Events and factors which would strongly influence the future market development were rated on nine-point importance and likelihood scales. In addition to the nine-point scales, three of the factors were also assessed using statements and Likert agree/disagree scales. The three statements used were:

1. “Europe presents a major opportunity as a new market for selling geodemographic data.”
(2) “It is likely that there will be a proliferation of small consultancies setting themselves up as geodemographic consultants after the next census is released.”

(3) “The use of PAC in geodemographic targeting systems will significantly improve their performance.”

The strength of agreement with these statements correlated well with assessments of their importance in other parts of the questionnaire, thus presenting some evidence for the internal reliability of the instrument.

Focusing on differences in the expertise among assessors, Dalkey[24] and Brown and Helmer[25] have shown in laboratory studies that those who rate themselves as experts provide more accurate assessments than self-rated non-experts. Dalkey’s work is particularly notable for its use of almanac-type data to assess various Delphi procedures. Best[26] too has shown similar results. In this study, experts were asked to rate their degree of expertise or ability to judge on a 1-9 expertise scale for each question answered. In computing the results, these expertise ratings provided a means of weighting the responses. A weighted group average was then calculated for each scale, the weights being provided by the expertise rating for that scale.

**Delphi Administration**

The questionnaire was administered by mail and, after agreeing to participate, all respondents received a letter explaining the Delphi method and the purpose of the expertise scales. Research by Waldron[27] shows that the quality of Delphi judgements can vary between estimation and feedback. The shorter the delay between making judgements and feedback, the better the judgement in subsequent rounds. As a consequence times were kept as short as possible and averaged about two to three weeks. The results of the rounds were summarized and the group mean and standard deviation fed back to the respondents. Those respondents who gave answers which lay outside the interquartile range were requested to give reasons for their more extreme assessments. Respondents were given the opportunity to revise their earlier opinions or estimates.

This iterative process is sometimes allowed to continue until a consensus is reached; little agreement, however, exists on what exactly constitutes a consensus[28]. A growing body of research has questioned the use of consensus as a stopping criterion for Delphi[e.g. 29-31]. One of the most common rules of thumb is stability in responses, and this criterion was used for this research. However, there is a danger that stability, i.e. where there has been no change in the group’s responses to a question from one iteration to the next, may occur through laziness. North and Pyke[32] noted that “too many panellists found it easier to agree with the estimates of others … artificial concurrence due to laziness can probably be assumed”.

Most changes in Delphi response occur in the first two rounds[33]. Dietz[34] has reported that decrease in forecast error between round one and three tends to be about 10 per cent. Other researchers have reported that not much is gained
in conventional Delphi by iterating more than twice[35]. In this study, three rounds were conducted in order to help establish stability and to give respondents the chance to rate the new information generated from the open-ended questions answered in the initial round.

Delphi is not without its problems and the attention of the reader is drawn to some of these, before we present the results. In so far as group opinion in Delphi is a sharing of responsibility, and response anonymity will enhance the diffusion of responsibility, one would expect group Delphi forecasts to be more optimistic and adventurous than individuals' forecasts. Stander and Rickards[36] raise the question of the effect of the Delphi researcher on the results. Assuming the researchers were relatively ignorant of the subject-matter, semantic "translation" difficulties can arise in the reorganization of data provided by the experts. If, conversely, the researchers themselves are experts, they would be liable to the inevitable processing bias and mental set in their interpretations of the material. This is particularly true when the statements generated during the Delphi must be clarified to reduce ambiguity. While every attempt was made to reduce interview bias, e.g. mail questionnaire, thorough piloting and only one researcher involved in the analysis, this type of criticism can never be completely overcome.

**Results and Discussion**

**Factors Inhibiting Market Development**

Panellists were asked to detail, in order of importance, the major factors which they felt were inhibiting the future development of the market. The rank order of six such inhibiting factors are:

1. Lack of client understanding.
2. Lack of reliable intercensal data.
3. Variable and high pricing.
4. Lack of industry standards.
5. Quality of some suppliers within the industry.
6. Too many different solutions.

The dubious quality of some suppliers within the industry was ranked as fifth most important but panellists also raised concerns about supplier personnel. First, there is a lamentably small number of competent staff within existing companies. Second, there were criticisms that the key suppliers within the industry were too computer-oriented and products were not sufficiently oriented to the marketing applications. Third, past over-claims as to the potential of systems by some suppliers had damaged the industry's credibility. Fourth, some experts were concerned about the quality of data and the methodology used to create classification systems. Fifth, industry credibility was further damaged by too much criticism by sales staff of rival systems.
Finally, pressure within some companies to sell systems rather than to answer client needs had resulted in unsuitable products being sold.

The most important factor inhibiting market development is a lack of client understanding. This is set against a background of inadequate education and training. User inertia, fear of new techniques and the low level of statistical and analytical abilities of many marketing executives were all thought to contribute to this factor. The decennial nature of the main data source was seen as a factor which reduces market potential, compounded by the lack of any reliable data between each census. Several criticisms were made of the actual products which were being offered by suppliers. The variable and high prices presented to the market were seen as very important inhibitors, making entry into systems too costly for many potential users. Criticisms of some systems being too direct-mail-oriented or being too complicated for client needs were also mentioned. Lack of industry standards in terms of classification systems and the vast array of PC products offered were thought to confuse customers.

In addition, several other factors were mentioned. These included the difficulty in analysing the benefits of such systems, some companies' obsession with criticizing the accuracy of the data, concerns over confidentiality, privacy and data protection, and poor service from the Post Office to users of the postcode system for non-mail purposes. Despite these drawbacks the industry's potential for growth is large.

**Market Potential**

The development of new markets was ranked as the most important factor affecting the future of the industry. Users of geodemographics for market segmentation now fall into many categories including oil companies, holiday companies, publishers, local authorities, motor manufacturers, retail groups, financial institutions, research organizations and the media. But which market sectors are yet to be developed? From where will future growth come from? Table I shows the sectors considered by panel members to have the greatest potential for growth in the sales of geodemographic systems.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Round 1 Mean</th>
<th>Round 2 Mean</th>
<th>Round 3 Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td>8.5</td>
<td>8.7</td>
<td>8.4</td>
</tr>
<tr>
<td>Retail</td>
<td>8.3</td>
<td>8.3</td>
<td>8.1</td>
</tr>
<tr>
<td>Mail order</td>
<td>7.6</td>
<td>7.9</td>
<td>7.7</td>
</tr>
<tr>
<td>Travel</td>
<td>7.0</td>
<td>7.2</td>
<td>7.3</td>
</tr>
<tr>
<td>Licensed trade</td>
<td>-</td>
<td>6.9</td>
<td>6.8</td>
</tr>
<tr>
<td>Restaurant</td>
<td>5.8</td>
<td>6.2</td>
<td>5.9</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>5.2</td>
<td>5.6</td>
<td>5.5</td>
</tr>
</tbody>
</table>

*1 = No potential; 9 = Immense potential
Licensed trade was suggested in the first round of the Delphi Panel's Opinion on Potential within Various Sectors
The most potential was seen to be in the financial sector, although this potential is likely to be attenuated by the current recession. One industry expert has recently commented that “Financial service companies and retailers ... are now at the leading edge of the geodemographic's market”[5, p. 22]. Other important sectors were retail and mail-order, while licensed trade, restaurant and manufacturing sectors were thought to present less potential. The standard deviations varied little over the three rounds with respondents being most in agreement about the potential of the retail sector and least in agreement about the potential of the restaurant sector, probably because the sector is so diverse.

The factors influencing market development and rated by the panel are listed in Table II. Some of these will be discussed together within the following subsections.

1991 Census

Some of the first computer-processed results from the 1991 census were published in May 1992. The County Monitors contain summary statistics for each English county or Scottish region and give details of present population, density, age distribution, ethnic groups and selected economic and household composition characteristics[37]. However, the major relaunches of the standard geodemographic classifications did not occur until 1993, when the Small Area Census Statistics were made available. The release of the 1991 census data was considered by panellists to be the most important single factor affecting the market's future (see Table II). Panellists thought that sales would increase by 40-50 per cent in 1993 and that between seven and ten new consultancies would be established on the back of this increase in market demand.

Some companies within the industry maintain that there is little to choose between the basic targeting systems on offer. Consumers new to geodemographics can be bewildered by the number and variation on offer. CACI believe it would be of tremendous benefit to the industry to have a standard basic set[38, p. 72]. The Office of Population Census and Surveys have considered this as an option. Panellists rated such a development as sixth in importance out of 14, with an absolute score of 6.2 (see Table II). A standard classification system produced by OPCS would have numerous advantages:

1. It would give official credibility to the industry;
2. It would remove the risks for first-time users and might stimulate new customers;
3. It would reduce the harmful claim and counter-claim which some companies pursue in order to “down” their competitors’ products;
4. It would provide the basis for many bespoke systems as data are added to the basic set;
5. It would provide a common language with which to link many market research databases.
## Targeting Consumer Markets

### Table II.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Round 1</th>
<th></th>
<th>Round 2</th>
<th></th>
<th>Round 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L</td>
<td>I</td>
<td>SD^b</td>
<td>L</td>
<td>I</td>
<td>SD^b</td>
</tr>
<tr>
<td>Release of 1991 census data</td>
<td>8.5</td>
<td>8.1</td>
<td>2.2</td>
<td>8.6</td>
<td>8.2</td>
<td>2.0</td>
</tr>
<tr>
<td>PC-based targeting systems</td>
<td>7.9</td>
<td>7.9</td>
<td>1.4</td>
<td>8.1</td>
<td>8.1</td>
<td>0.9</td>
</tr>
<tr>
<td>Cost reduction, through installation of</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6.7</td>
<td>6.7</td>
<td>1.8</td>
</tr>
<tr>
<td>client-based PC systems</td>
<td></td>
<td></td>
<td></td>
<td>7.6</td>
<td>7.6</td>
<td>2.4</td>
</tr>
<tr>
<td>Underdeveloped markets, e.g. FMCG</td>
<td>68</td>
<td>68</td>
<td>4.0</td>
<td>6.9</td>
<td>6.7</td>
<td>2.9</td>
</tr>
<tr>
<td>Off-the-shelf database models</td>
<td>6.7</td>
<td>6.6</td>
<td>4.1</td>
<td>6.9</td>
<td>7.0</td>
<td>3.2</td>
</tr>
<tr>
<td>Behaviourally-based databases, e.g. Behaviour Bank, Investors' Database</td>
<td>65</td>
<td>63</td>
<td>3.3</td>
<td>6.4</td>
<td>6.3</td>
<td>3.2</td>
</tr>
<tr>
<td>Industry Standard Classification</td>
<td>63</td>
<td>57</td>
<td>3.0</td>
<td>6.4</td>
<td>5.5</td>
<td>2.1</td>
</tr>
<tr>
<td>The expected growth in direct mail</td>
<td>82</td>
<td>58</td>
<td>2.2</td>
<td>7.7</td>
<td>6.1</td>
<td>2.3</td>
</tr>
<tr>
<td>Age targeting systems, e.g. CACI's MONICA</td>
<td>57</td>
<td>55</td>
<td>2.4</td>
<td>6.0</td>
<td>5.8</td>
<td>2.4</td>
</tr>
<tr>
<td>New higher education courses in database and GIS usage</td>
<td>57</td>
<td>53</td>
<td>1.7</td>
<td>5.4</td>
<td>5.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Removal of trade barriers in Europe</td>
<td>58</td>
<td>56</td>
<td>2.3</td>
<td>5.8</td>
<td>5.7</td>
<td>2.5</td>
</tr>
<tr>
<td>Government initiatives, e.g. proactivity of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPCS, ESRC/NERC research</td>
<td>58</td>
<td>47</td>
<td>1.8</td>
<td>5.2</td>
<td>4.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Expert consumer-targeting systems</td>
<td>43</td>
<td>42</td>
<td>2.2</td>
<td>4.0</td>
<td>4.0</td>
<td>2.1</td>
</tr>
<tr>
<td>Pinpoint's Postal Address Code</td>
<td>4.0</td>
<td>36</td>
<td>2.2</td>
<td>3.3</td>
<td>32</td>
<td>1.9</td>
</tr>
</tbody>
</table>

L = Likelihood where 1 = Extremely unlikely 9 = Extremely likely
I = Importance where 1 = Unimportant 9 = Extremely important

^bIt should be noted that discussions of the relative rankings of factors 1-14 in TableIII may slightly mislead readers into thinking that some of the lower ranked factors are unimportant. This is not the case. In order to be included in the final list in the first place, factors had to be of some importance. Additional information on this comes from the range of absolute important ratings. Only the two lowest items fell below the neutral point on the scale (4.5).

^bThe standard deviation given is an average of the standard deviation for both the likelihood and importance ratings. Some of the SDs were reported only to give an indication of agreement and the two scales showed consistently similar SDs for each item. This procedure seemed reasonable and increases the ease of interpretation.
It now seems unlikely that standard classification will materialize. For the moment, either ACORN or Mosaic are the nominal industry standards.

Computer Developments
One such development is database modelling. Ranked as the fifth most important factor influencing the market's future development, it is set to become part of the second generation of geodemographic targeting tools. Databases from many sources are collected and analysed to predict responses, sales or starters better from a mailing campaign. Subsequent mailings benefit from the first as the information from it can then be used as an additional database and a response model constructed. Credit Data and Marketing Services (CDMS) currently have several database modelling (DBM) packages which run on mainframes and micros. DBM1 is based on the Automatic Interaction Detector Technique and is useful for predicting continuous variables (e.g. sales), while DBM2 attempts to predict a categorical variable with two or more categories (type of goods bought). DBM3 is a much simpler approach, more akin to multiple regression, but with some special features[9, p. 126].

Pinpoint was investing heavily to increase the accuracy with which respondents can be identified geographically. One of the first steps in determining each respondent's geographical location is translating from address information to grid references, as used by the Ordnance Survey. In the UK, this is achieved via the Central Postcode Directory (CPD), a file containing all 1.6 million postcodes and an Ordnance Survey grid reference for each. However, owing to errors and problems of resolution the grid references held on the CPD are not completely accurate. The Pinpoint Address Code (PAC) gives each address on the postcode address file a digitized Ordnance Survey reference at 1-metre resolution. Unfortunately, the overwhelming feeling of the panel was that this development would contribute very little to the industry's future and rated PAC as being the least important of all the factors mentioned. The problem has to a large extent been overcome by OPCS which has now linked all postcodes to enumeration districts. However, they are not intending to update it and this will have to be done by individual companies.

Further developments include the use of artificial intelligence systems. Openshaw[9, p. 121] recognizes the importance of the major sources of errors and uncertainties in all the available segmentation systems. They are:

1. the geographic linkage error of postcodes to enumeration districts;
2. the effects of assigning to individual people or households the characteristics of areas (ecological inferencing errors);
3. classification errors (a census enumeration district is assigned to the "wrong" neighbourhood type);
4. uncertainties that a census enumeration district might belong to more than one neighbourhood type;
5. effects of post-census change.
The Pinpoint Address Code (PAC) will resolve some of the geographic linkage error problems, but not all of them. Some assignment errors will always remain because the census enumeration districts in 1981 and 1991 are not based on unit postcode boundaries. One solution is to use artificial intelligence methods to develop a smart targeting system which seeks to exploit rather than to remove the areas of uncertainty in geodemographics. Such systems will improve the targeting effectiveness of mailing by focusing on "fuzzy" classification areas. Despite the intuitive appeal, the unproven success and newness of AI techniques in geodemographics resulted in panellists rating the expert systems as being a relatively unimportant factor in the future success of the market.

In contrast with the lower perceived importance of AI computer developments, other PC-related developments were ranked as the second most important factor affecting market development. The third most important factor was the cost-reduction which PC-based systems allow. It is this cost reduction which will help to expand the market. Increasing PC performance has allowed a wide range of market analysis software to be developed. Greater user-friendliness and better mapping facilities have resulted in more and more managers being able and willing to do the market analysis for themselves. Many programs are modularized and, as the expertise of the user increases, more modules can be added as and when necessary.

SPA Marketing Systems were the first on the scene with their "Marketing Machine". CACI launched "Insite", Pinpoint launched "Geo-pin" and CCN has MOSAIC System. These systems were mainly developed in-house, but users also have a choice of other off-the-peg systems from the USA, e.g. ARC-Info, Compass, and from the UK, e.g. SPA NS and GFIS. Greater Manchester Research have announced the "simplest, easiest to use and lowest cost GIS package for spatially analysing census data". The single user price of Geographic Interrogation of SASPAC and Mapping Optic (GISMO) was £299 for commercial agencies[37]. Two of the main advantages the PC-based systems offer the user is the ability to run "what-if" scenarios and to run as many analyses as desired at no extra cost. The development of PC-based analysis systems is seen as the key to future success, together with increasingly sophisticated delivery systems. In Holland, for example, video disks have now been used for some time in the geodemographics market[5].

The Government has recognized the importance of handling geographic information in commissioning the Chorley Report[39]. The report encourages the use of GIS to analyse and store databases, such as the census, in order to make cross-analysis with other geographic databases easier[40] and stresses the importance of further research. The ESRC and NERC responded to this recommendation by establishing a £1.05m research programme running for three years from October 1990, designed to aid the introduction of GIS into the public and private sectors. Much of this work is being carried out by Regional Research Laboratories established by the ESRC. Additional Government emphasis is also being placed on the market value of information held by Government departments. The Department of Trade and Industry Tradable
Information Initiative\cite{41} encourages Government departments to take stock of the data that they collect and to examine what data, if any, has market value. Given that many of these data can be geographically referenced, it will give additional impetus to GIS development. Initiatives such as this and the increased proactivity of OPCS in marketing the census data, however, were not considered by panellists to be important factors in influencing the market’s future. Government initiatives were ranked 12th in importance.

Non-Census Databases and Bespoke Systems
The development and availability of other databases, particularly behavioural, were considered to be important. Initially, these lists began as mailing lists, the advantage of which is clear compared with traditional geodemographic targeting. Mailing lists allow precise target identification. For example, a geodemographic system can identify a set of households which are most likely to own microwaves, but a mailing list of microwave owners will identify the respondents unequivocally. The traditional disadvantage of mailing lists have been their incompleteness and their inability to identify sales prospects. Several companies are now developing customer databases to a massive extent. They include National Consumer Database by ICD, Lifestyle Selector by NDL, which has over 10 million names, and Behaviour Bank by CMT, which gathers over a million questionnaires each year. Much of the information is based either on actual purchase behaviour and completion of guarantee cards or on assessment of professed purchases, hobbies and interests using questionnaires such as the National Shoppers’ Survey (CMT) and Facts of Living Survey (ICD). Their sheer size makes them an important source of detailed consumer information at the level of the individual. These databases help in the development of bespoke or tailored classification systems, which will become the norm for the 1990s. One of the first to combine has been CCN and CMT, to produce PERSONA, mentioned earlier, but there is scope for much more collaboration. Openshaw\cite{9, p. 118} writes:

As yet, there is a vast source of untapped data from sources such as credit card companies, telecommunication organisations and owners of ATM and EFTPoS networks. As these sources become available, the potential for “bespoke” systems is enormous.

The Delphi panel ranked the use of these non-census databases as being of reasonably high importance (sixth out of 14). A related extension to bespoke systems is database fusion. Data fusion is becoming one of the most exciting prospects for the 1990s. Some of the fusions which were suggested by panel members are shown in Table III. Even allowing for the fact that up to 6-7 per cent of those eligible to vote (15-20 per cent in inner city areas) do not appear on the electoral roll, the source is widely used because it provides relatively up-to-date information on household composition, young voters, recent moves and length of residence\cite{5, p. 20}.

One of the advantages of fusing other databases with geodemographic classifications is to overcome two problems relating to age. First, traditional
geodemographic classifications are not very sensitive to the age of the target group; CACI devised MONICA to try to overcome this and it was anticipated that improved age targeting would have a substantial effect on sales. Delphi panellists ranked this factor as ninth out of 14, indicating that the age-targeting improvements would be of medium benefit to the industry’s development. The age dimension is particularly important for those involved in direct mail promotions. The expected continued growth in direct mail was expected to provide a continued and increasing role for geodemographics and response modelling. The experts, however, felt that the future expansion in the market would be driven more by factors other than the expected growth in direct mail; thus the factor was ranked eighth in relative importance. The second age-related problem is the age of the census data during most of the period between censuses, plus the difficulty in updating this information.

One of the major developments in the future will be the increasing use of bespoke classification systems. FinPin was one of the first widely available bespoke systems for the financial sector. Delphi panellists gave this factor a 6.1 importance rating, which placed it seventh in relative order of importance. Panellists rated the likelihood of bespoke classification systems being developed for three major product classes (see Table IV). The most likely appeared to be for cars, followed by holidays and then food. Other suggestions for future bespoke systems included leisure, estate agents, alcoholic drinks, mail order, health insurance and health products, consumer durables and lifestyles.

The development of bespoke systems does not have to wait for the increasing availability of commercial survey data with which to link. In-house databases from organizations such as banks, building societies, insurance companies,
home-shopping companies, etc. can be used to create bespoke systems for individual organizations. "In five years' time, one imagines that this approach will be both more widely accepted and far more important than it is to-day" [9, p. 118]. It has been suggested that, as customer databases become bigger and more robust, this will reduce businesses' reliance on census data. In the USA, this has helped to persuade a Census Bureau anxious to reduce cost to consider a postcard census which would collect the barest of detail[42].

Education
Panellists strongly agreed that “the majority of customers using geodemographics have a poor understanding of the data”. Time and time again industry experts expressed the problem of client ignorance as being the major factor inhibiting the industry’s development. Openshaw [9, p. 125] writes: “geodemographics is really about response modelling, except that not many users realise it”.

Partly in response to market demand and partly because of Government stimulus, courses are now being established which specifically address database usage, GIS, etc. In addition, many private sector organizations are now organizing training seminars and briefings, e.g. the Market Research Society and Target Marketing Consultancy[37]. Although important to market development, this factor was ranked only tenth from 14, with an importance rating of 5.2 (see Table II). The benefits of these programmes in contributing to substantial market development may not be seen for years. However, they do provide a reservoir of competent and knowledgeable users, which is essential for more sophisticated geodemographic applications. It is likely to be these more sophisticated developments which provide the future potential value of the market. One other factor which was considered to have an appreciable effect on the industry’s future is the experience gained by consultants using geodemographics. As Openshaw puts it:

The major improvements are only going to occur by a process of endogenous developments by practitioners working within the domain of the existing geodemographics industry[9, p. 112].

Some panellists felt that a fundamental issue was the development of value-added products through the greater provision of services and consultancy, rather than simply the provision of data.

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<thead>
<tr>
<th>Product class</th>
<th>Round 2</th>
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<tr>
<td></td>
<td>Likelihood</td>
<td>SD</td>
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<tr>
<td>Cars</td>
<td>6.9</td>
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<td>Holidays</td>
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<tr>
<td>Food</td>
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*a1 = Extremely unlikely  9 = Extremely likely
Over 90 per cent of the world's population growth will occur in developing countries, only 10 per cent in the industrialized nations. International demographics, therefore, are going to be an increasingly important issue. The Single Market should also stimulate interest and opportunity in geodemographics within Europe; however, Delphi panellists were reasonably agreed that the removal of trade barriers in Europe would not be very important for the future of the industry and rated this factor tenth out of 14.

There are reasons for this. As Bartos[43, p. 205] points out: "There is no such thing as a simple demographic fact in international research". Attempting to answer the question, "How many women are in the workforce in different countries?", she received wildly conflicting estimates. Some countries based their reports on 16 years of age and over (e.g. USA). Many of the other countries start at age 15, whereas Italy goes down to 14[43]. When considering life-cycle status, no official information was available in the Federal Republic of Germany and information had to be gleaned from the Basisresearch Trendmonitor, 1985. The only available life-cycle information from Italy related to the marital status of women, which was obtained from the 1981 census[43]. Different censuses contain different questions, different age breaks, different industrial classifications and so on. Within Germany this problem is increased because each Lander distributes its own census form with its own choice of questions and variables. In Sweden, the Census contains questions on income (as it does in the USA), whereas in other European countries, such as Britain, wealth information has to be derived from other surrogate variables such as car ownership, home ownership, etc.[6] For most countries the most recent census data were published in 1980 or 1981. The EC currently requires member countries to provide certain census type information in a harmonized manner, but does not stipulate any particular method. In future, it may have greater requirements in terms of substance, methodology and timing[44].

Another difficulty in creating a European network lies in differing postal systems. The Postcode-Enumeration District (ED) connection is vital in linking addresses to census information. In Britain, one postcode refers on average to 15 households; however, in many European countries a single postcode refers to a large area. For example, in Belgium, each postcode refers to a commune (of which there are only 596 in the whole country) each containing between 5,000-15,000 people. In Germany, Norway and many other countries, similar problems exist[6]. Despite these problems, CCN's International Network sells geodemographic systems and classifications from offices in Sweden, Germany, Holland, Belgium, Spain, France, Italy and Finland. Many of these joint ventures and linkages between organizations based in different countries are forming the basis of a European geodemographics industry, and have led to the development of Euromosaic, which is perhaps the most significant innovation in European target marketing in many years. It allows companies to analyse any address in nine European markets using a consistent set of ten geodemographic categories.
Conclusions

Geodemographic classification systems have exerted a major influence on marketing analysis and decision making within many sectors. Few marketing practitioners can afford to ignore these developments, be they FMCG manufacturers, retailers, financial institutions, service providers or non-profit organizations. The applications range from enhanced segmentation systems to customer profiling, branch location analysis, credit scoring, direct marketing, survey sample selection, demand forecasting and media selection.

Existing systems do, however, have limitations, notably an emphasis on neighbourhood rather than individual characteristics. A high level of dependence on census data, which may be between two and 12 years old, also represents a problem. Improved systems are, however, constantly being developed, making it essential for practitioners and researchers to keep abreast of current and future developments. In order to provide further insights into the potential developments within this industry, a Delphi questionnaire was developed and administered to a panel of 15 acknowledged experts. The Delphi process was taken through three rounds and the topics included factors inhibiting development, market potentials and factors which may stimulate future development.

The collective view was that the industry appears poised for a few boom years, following the release of the 1991 census data. The most important long-term factor is the continued development of PC-based market analysis, which is enhanced by the continued fall in hardware and software costs. Datafusion techniques were forecast to improve, as were geodemographic methodologies and models. Expert systems will have an increasingly important role to play and there will be a change of emphasis from data provision to system design. Methods of deciding which is the optimum number of classification groups are likely to be developed and there will be a greater emphasis on the search for alternatives to the population census.

The incorporation of syndicated lifestyle, psychographic and behavioural data into systems will be complemented by the growth of in-house client bespoke systems. There will also be more involvement of trained market researchers/analysts, as opposed to computer experts, in supplier companies. In terms of new areas, there will be much more international work and increasing application of geodemographic techniques to “business-to-business” marketing. New markets for which specific systems products have yet to be developed include travel, licensed trade, restaurants and various manufacturing sectors.

In short, the systems are focused increasingly on providing answers and solutions to the problems faced by marketing practitioners, rather than merely offering access to vast databases. As the systems become more user-friendly, so too are managers becoming more receptive to this form of market analysis. Most importantly, some of the fundamental problems and limitations of the early databases are being overcome by the blending of different data types and sources. Given the developments outlined and those which are likely to occur, it
could well be that the word “geodemographic” will cease to be a sufficient description of the range of activities within this maturing industry.

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