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THE USE OF EXTERNAL INFORMATION BY MANAGERS IN LARGER INDUSTRIAL COMPANIES WITH SPECIAL REFERENCE TO THE ROLE OF ELECTRONIC EXTERNAL INFORMATION SERVICES

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ABSTRACT

This research examines the use of external information by managers in larger industrial companies, with special reference to use of electronic information services. Five different industries are selected for study - oil, pharmaceutical, construction, electronics and retail.

Evidence on the areas and sources of external information of most importance to managers, including electronic sources, was sought by means of a questionnaire survey distributed to managers in marketing, finance, corporate planning, computer systems and management services and to company librarians/ information officers. The questionnaire was completed by 122 managers from fifty-one companies and followed up by case study interviews with eleven selected respondents.

All respondents agree on the importance of industry market trends and competitor activities as the main areas of external information and on the personal communications network and industry publications as the prime sources. Information of the organization's broader environment is viewed as less important. Company libraries, where they exist, are not always highly regarded or fully exploited as sources of information by managers.

The research shows that electronic information services are not in general rated highly as an information source. The main reason for the lack of use by managers appears to be lack of content relevance, but lack of awareness, pricing structure and accessibility are also contributory factors. Videotex services are held in low regard by their users and non-users alike. Commercial databases, on the other hand, are valued by their main user group, which consists of librarians from the pharmaceutical industry and from larger oil companies.

Type of industry, type of respondent and size of company are all important variables in use of electronic information services. The research identifies four different approaches to external information use - individual, library, systems and information management. In spite of the acknowledged importance of external information, the informal approach is still prevalent. There is no extensive use of electronic services in companies which do not have an established library structure and there are few examples of a properly structured 'information management' approach which combines both internal and external sources.

CHAPTER 1 INTRODUCTION

1.1 CONTEXT OF THE RESEARCH

The focus of this research project is the way managers use external information and in particular the use being made of electronic information services. The study concentrates on larger industrial companies with an annual turnover in excess of £40 million.

The amount of external information available to the manager has increased substantially over the past few years through developments in information technology. Bibliographic databases, which have long been established in scientific and technical information services, now also provide extensive coverage of business and management subjects. A wide range of online databases have been developed to provide direct access to company and financial information and full-text versions of newspapers and business journals. Videotex services such as Prestel are also offering a range of company information services. This range of electronic services has therefore potentially increased both the amount of external information available to managers and its accessibility to them.

As external information is becoming more readily available, there is at the same time a growing awareness

of its importance in strategic planning and decision-making. Managers need information on market trends and on the activities of competitors, on technological developments and on the broader economic, political and social environment in which the organization operates. This type of information is not generally available through the company's own formal system, which has tended to concentrate on the internal operating or control information on which routine decision-making at supervisory or middle management level depends. For managers themselves, strategic decisions rely much more heavily on information from outside the organization, which is available from a variety of different sources.

1.2 NEED FOR THE RESEARCH

Interest in this research area arose from observation of the very different treatments of external information issues in the management and library research literatures. On the one hand, management research, while acknowledging the importance of external information, pays little attention to the means of acquiring it and often appears to take for granted that the manager's own informal network of personal contacts is the most widely used and appropriate source. There is little description of alternative sources and few mentions of the potential contribution of either libraries or electronic information services to the manager's external information needs.

On the other hand, information professionals are pointing to managers' low level of awareness and use of the range of information resources available to them. This study represents an attempt to bridge this gap by seeking the views of both managers and librarians on the value that they place on external information in general and on electronic information services in particular.

By seeking the views of managers on their information needs, the study makes a contribution towards the user studies literature on which any understanding of the process of information acquisition and use must be based. For this reason, evidence of use of electronic services is set within the context of the manager's general approach to external information issues. Use of electronic services cannot be studied in isolation from other sources of external information. Such a 'technology-led' approach runs the danger of putting the capabilities of the systems themselves before the actual needs of the managers.

1.3 SUMMARY OF AIMS AND OBJECTIVES

The aims of this research are to explore the use of external information by managers in larger industrial companies, and to consider the effects of electronic external information services on patterns of use.

The objectives of the research are as follows:

- To ascertain the areas and sources of external information of most importance to managers in larger industrial organizations.

- To determine the extent of use of online databases and videotex services and their rating as information sources.

- To examine the effects of type of industry, company size and function of respondent on external information value and use.

- To look at characteristics of users and non-users of external information services and to examine reasons for the patterns of use identified in the research.

- To explore the relationship between company structure and external information use and investigate approaches to information management in different organizations.

1.4 STRUCTURE OF THE THESIS

The following structure has been adopted:

CHAPTER 2:	Review of the relevant research literature from the management and information fields
CHAPTER 3:	Description of research methodology
CHAPTERS 4-5:	Results of the questionnaire survey and case study interviews
CHAPTERS 6-7:	Analysis of results and comparison with previous research studies
CHAPTER 8:	Consideration of findings in relation to type of industry, company size and function of respondent.
CHAPTER 9:	Patterns of use of electronic external information services and approaches to use within different company structures.
CHAPTER 10:	Summary of research findings.

CHAPTER 2 LITERATURE SURVEY

2.1 MANAGERS' INFORMATION NEEDS

In determining managers' information needs, a distinction is generally drawn between internal and external sources, formal and informal channels, and control and strategic types of decision. Much research in the management information field has concentrated on internal information and the management of control systems. (Dew & Gee, 1973; Bentley, 1980; 1981; Tricker & Boland, 1982; Carter, 1981; 1983). The relationship between management and decision-making is explored by Cyert and March (1963) and by Simon (1977). More attention is focussed on the external environment in studies which adopt the systems approach to the management of organizations (Johnson, 1973; Pfeffer & Salancik, 1978). These studies, while emphasising the importance of external information, make little attempt to describe the sources of information which managers use or their methods of information acquisition. The management literature of most direct relevance to this research therefore comes not from the information systems field but from studies of managers' work activities and from the literature on environmental scanning.

2.2 MANAGERS' WORK ACTIVITIES

Stewart's research, first published in 1967, (Stewart, 1988), looked at managers' work activities through a survey of 160 managers who agreed to keep diaries over a four week period. This survey was important in demonstrating the fragmentary nature of much managerial work, with 'Informal discussions' the dominant activity.

Mintzberg also looked at managers' work, in a study that has been influential in its classification of the manager's information roles (Mintzberg, 1973). In contrast to Stewart's wide-ranging diary survey, Mintzberg chose structured observation to conduct an in-depth study of the activities of five chief executives in US companies. His analysis, during a one week survey period, of each executive's mail and contact records, together with interviews, led to his formulation of a theory of the manager's work characteristics and working roles. He distinguished ten interrelated working roles: three interpersonal (figurehead, liaison and leader), three informational (monitor, disseminator and spokesman) and four decisional (entrepreneur, disturbance handler, resource allocator and negotiator). Mintzberg shows that it is through the manager's interpersonal roles that he becomes a focus for both internal and external information, building up his network of personal contacts to feed him with the 'current, trigger and verbal

information' on which he depends. For the purposes of this research, Mintzberg's work is important for its demonstration of the manager's strong preference for verbal communication and for informal sources of information.

2.3 ENVIRONMENTAL SCANNING

The classic study of external information use is by Aguilar (1967). He introduced the concept of environmental scanning, or the systematic search for information on the company's external environment. Aguilar's work examines what information managers obtain about the external environment, what sources they use and their methods of acquiring such information. The first stage of his research consisted of in-depth interviews with managers mainly from the chemical manufacturing industry. In total, 137 managers from 41 companies took part in the survey. From the interviews, Aguilar was able to provide a descriptive account of the major areas and sources of external information for managers and to draw up an analytical framework of modes and rules for environmental scanning. He followed the interviews with a number of case-studies which related to the interview findings and also led to some more general conclusions and propositions for the improvement of environmental scanning techniques.

Aguilar identified four 'scanning modes' used for gaining information on the external environment. The two 'viewing' modes were either 'undirected' or 'conditioned' depending on whether a specific area of information had been identified for the manager who was 'keeping an eye' on the environment. The two 'search' modes involve a more active approach to scanning and could be either 'informal' attempts to gain a specific piece of information or 'formal search' conducted on a regular basis, for example in an R & D department. While 'formal search' represents the ideal method, Aguilar recognised that this scanning mode was not practicable in every eventuality. Sets of rules were therefore formulated to determine the most appropriate scanning mode. These rules could be either 'issue-related' and dependent on the importance of the particular issue to the organization, 'information-related' depending on the availability or adequacy of data, or 'capacity-related' depending on the time, resources and staff available within the organization.

In analysing the results of his research, Aguilar makes the important distinction between strategic information and more general information on the firm's environment. Among areas of information, he found 'Market tidings' to be predominant for managers of all functions, with broader environmental issues of little importance.

Personal contacts outside the company were the most widely used source of external information.

Keegan's research (1967, 1968, 1974) looked at the scanning of the external environment for information relating to strategic issues in international operations. His objectives were first to describe areas and sources of information and the manner of information acquisition and then to draw up a model of the scanning process. Like Aguilar, he concentrated on strategic rather than control information and his research was based on interviews with company executives; in this case, fifty executives in the headquarters of thirteen US food and manufacturing companies operating internationally. He too used the 'critical incident' technique asking executives to recall specific instances where external information had been used.

As in Aguilar's survey, marketing information emerged as the most important area for all executives, but in relation to issues of strategic importance, Keegan found a manager's function to be an important influence on the scanning process. Personal sources were again the preferred method of acquiring information.

Keegan's conclusions were that managers placed a heavier reliance on external information sources than had previously been supposed, but that systematic methods of scanning for information, whether computer-based or

manual, played little part in the process of information acquisition where 'surveillance' of an area of interest was preferred to the more active 'search' mode.

The work of Kefalas and Schoderbek (Kefalas & Schoderbek, 1973; Schoderbek, Schoderbek and Kefalas, 1980) combined research on systems theory with the findings of Aguilar and Keegan. Their study investigated a series of propositions relating to the acquisition and use of external information within the wider context of management systems, stressing the role of information as a link between the organization and its environment and the importance of scanning the external environment as part of the organization's decision-making process.

Kefalas and Schoderbek based their research on two industries, one operating in a dynamic environment (farm equipment) and one in a stable environment (meat-packing). Interviews using a structured questionnaire were used with forty executives in a total of six companies. They found, like Aguilar, that more time was spent on acquiring market information, which they termed 'relatively controllable' and less on the 'relatively uncontrollable' broader external environment.

By introducing a category of 'combination' sources in addition to 'human' and 'documentary' which equate more readily with the categories used by Aguilar and Keegan, Kefalas and Schoderbek note less reliance on personal

sources and also show the greater importance attached to publications and to meetings which combine elements of both categories. They note, however, the manager's preference for informal meetings which form part of his personal communications network. This example illustrates how in this research area differences in research method and in definition of categories can lead to seemingly different results. In fact, the main contribution of Kefalas and Schoderbek to environmental scanning research lies in their attempt to relate findings to the systems approach and to draw attention to the greater need for external information by companies operating in a dynamic rather than stable environment.

Fahey and King (Fahey & King, 1977; Fahey, King and Narayananan, 1981) relate their findings on environmental scanning activity to the corporate planning process. They investigated twelve large firms and interviewed key planning officers within each, using a survey instrument based largely on the categories used by Aguilar. In their research, the 'regulatory' and 'economic' areas emerge as the most crucial and the most likely to be integrated into the long-range planning process.

Three scanning models were identified: irregular, or 'ad hoc crisis reaction'; regular, or 'decision or issue oriented'; and 'continuous', or the systems-oriented approach which leads to continuous monitoring of the

environment rather than specific events. From this small-scale study, they found only two examples of advanced environmental scanning systems, with other firms relying on ad hoc irregular scanning. This closely follows the findings of Aguilar and Keegan. For what they considered the 'ideal' method of continuous scanning to be effective, they recognised the importance of integrating scanning into the organization's planning process. This, they saw, had implications for company structure as it would require a 'central clearing-house for environment information', possibly using computer-based systems. Stubbart (1982), following up Fahey and King's research, found many obstacles to the setting up of such central units, especially in diversified companies. Thomas (1980) concluded from published sources that only the very largest US companies were engaged in systematic environmental scanning. Diffenbach (1983) in a study of large US companies found an appreciation of the importance of environmental scanning, noting greater effort at the corporate than divisional level.

Hambrick based his research on the earlier work of Aguilar, Kefalas and Schoderbek and Mintzberg (Hambrick, 1981). His main interest was to explore further the links between environmental scanning and both hierarchical levels and functional areas. As previous studies had concentrated on manufacturing industries, he chose to

study service organizations in three different categories (colleges, hospitals and insurance). He used mailed questionnaires to 203 executives in first, second and third level posts within twenty-one service organizations.

The research methods used by Aguilar relied on the 'critical incident' technique and did not measure the amount of time which executives spend on environmental scanning nor the intensity of their effort. Some attempt was made by Kefalas and Schoderbek to quantify scanning effort and Hambrick builds on this in his questionnaire by introducing an attempt to measure both time and level of interest.

Hambrick's results agreed with previous research in finding only a very limited relationship between hierarchical level and environmental scanning activity. Similarly, there were few relationships between function and scanning, except in the finance areas where jobs were more closely defined. This finding points again to the 'ad hoc' nature by which environmental scanning is carried out and Hambrick drew attention to the duplication of effort this can involve in some cases and the danger of 'scanning voids' in others.

Bhatty (1981) looked at the corporate planning process in medium-sized British firms. While almost all companies in his survey engaged in corporate planning, consideration of the broader external environment was not widespread.

Rhyne (1984; 1985), like earlier researchers, emphasises the importance of external information to the company's strategic planning process. His survey of 89 'Fortune 1000' companies looked at the nature of the planning process in relation to types and sources of information. He identified five planning types (short-term forecasting, budgeting, annual planning, long-range planning and strategic planning) and found that long-range planning was the most frequently used, with only one-third of companies operating 'true' strategic planning which looked beyond the company's immediate environment.

Rhyne found a significant relationship between external and environmental information and strategic planning, although like Aguilar and others, he noted that information on the broad environment was considered relatively unimportant. External personal contacts were also more important to companies conducting strategic planning. He concluded that companies which sought to establish strategic planning systems would need to turn their attention more to environmental factors and stressed, as had Fahey and King, the relationship with company structure and the link between the information gathering process and company decision-making.

In the light of the importance which these research studies have placed on the environmental scanning process, Jain sought to establish how widely it was actually

practised in US corporations (Jain, 1984). His study included personal interviews with 37 executives in eleven large companies and a mailed questionnaire to the chief executives of all Fortune 500 companies. From his findings, Jain identified four phases in the evolution of an environmental scanning system - primitive, ad hoc, reactive and proactive. He found the majority of smaller firms in his study in the 'primitive' phase, medium firms in the 'reactive' phase and larger in the 'proactive', pointing to the time factor involved in the process.

Once again, the social environment came last in ranking and examples of scanning came only from those in the 'proactive' phase. The economic environment, on the other hand, was the most significant at all stages. A variety of organizational arrangements for environmental scanning were encountered in this research and Jain stressed the need to distinguish between scanning for strategic information at the corporate level and for product/market information at the functional level. Like Rhyne, Jain saw the success of environmental scanning as heavily dependent on the pre-existence of a strategic planning system.

2.4 ACQUISITION OF EXTERNAL INFORMATION

The research studies cited above provide descriptive accounts of managers' use of external information. They generally concur on the importance of informal personal

sources for providing such information, and on the lack of formal environmental scanning systems. At the same time, they point to the importance of the external environment and the need to link environmental scanning with the strategic planning process. What is generally lacking is any account of how this is to be achieved. While they may point to the need for central environmental scanning units, there is only very rare acknowledgement of the role that company libraries or information units could play, or, in the later works, of any recognition of the role of computer-based information systems.

Roberts and Clarke have recently made a study (Roberts & Clarke, 1987b) of the way external information issues are treated in the management literature, as seen from the information specialist's viewpoint. This is a valuable attempt to integrate the two separate disciplines of management information and information science. They criticise the treatment of external information issues as being descriptive rather than analytical and of paying little attention to the information acquisition process. In their view, the acceptance of the informal personal network as the most important source of external information even in very large companies makes the information issue appear 'non-problematical' and leads to neglect of the role that the information specialist can play.

Roberts and Clarke's work represents a valuable first attempt at integrating the two separate research areas. While they are right to draw attention to lack of detailed discussion of external information acquisition in the management literature, they fail to take adequate account of the reasons for the importance of the personal network, and in particular, overlook the findings of management research studies on the importance which is also attached to published sources of external information.

Mintzberg's study of managers' work activities (Mintzberg, 1973) showed that a wide range of printed sources were consulted. More detailed studies of managers' use of publications have since been carried out by Blagden (1980a) in a survey of reading habits among British Institute of Management members and by Gent (1987) in a study of managers in electronics companies.

Roberts and Clarke have themselves produced a series of case studies of manufacturing firms (Roberts & Clarke, 1988) which concentrated on information analysis and acquisition. The case studies were drawn from a study of ten small to medium-size firms and involved interviews with 82 managers, mainly from financial management, sales and marketing. The main aim was to identify the 'information seeking and using behaviour' of the managers interviewed, concentrating on the information acquisition process which management research studies had previously

neglected. By concentrating on specific incidents within the case study companies, Roberts and Clarke were able to analyse each situation to see what actually happened and what could have been done to meet the particular information need. In their general findings, they too find personal sources ranked first, followed by journals and note that information requests generally arise from an immediate problem, rather than as part of the strategic planning process.

White and Wilson (White, 1986; White and Wilson, 1988) use the same case study material from this Sheffield University project to look at patterns of information need and use by managers in different functional groups. They found no correlation between function and information need and agreed with Mintzberg on the fragmented nature of the manager's job and the preference for informal methods of gaining information in response to an immediate problem.

As with these case studies, recent research in this country has concentrated on the smaller firm, where the need for education on information use is thought to be greatest and where public libraries and other outside agencies might have a larger role because of the absence of in-house services. Capital Planning Information have conducted two surveys, of small manufacturing firms (1982) amd small retail and service firms (1985). In the former study, 200 firms were selected to take part in an

interview survey. Information needs, as in the Sheffield University case studies, arose from immediate problems connected with specific events. Public libraries and other information providers were an under-used resource, with face-to-face contact with an intermediary being regarded as the most effective way of promoting use. The retail survey was conducted on similar lines and produced similar results.

A study conducted by the Centre for Urban and Regional Development Studies (CURDS) at the University of Newcastle-upon-Tyne (University of Newcastle-upon-Tyne, 1983) tested the suggestion in the Capital Planning Information studies that more face-to-face contact was needed to promote greater information use. The project's greatest success was in the provision of technical information. For other types of information, it proved difficult to persuade firms to use sources that were unfamiliar to them and information needs were often imperfectly understood.

In a similar study conducted by Suffolk Public Libraries (Trott & Martyn, 1986), the intermediary approach was also tested, with the research officer providing an information service to the small firms taking part in the project. This reinforced the value of personal contacts in meeting information requests.

2.5 THE ROLE OF LIBRARIES

The studies described in the previous section were all conducted in small firms which did not generally have their own library or information service. Another field of research has looked at the role of libraries in the provision of business information. A report on the role of the British Library (1982) called for more research into user needs. This led to a project at Liverpool Polytechnic to consider the provision of business information services in public libraries and users' reactions to them (Bakewell & Roper, 1984). This research found public libraries trying to provide services within resource constraints, but suggested a need for more promotion of services available. Hyde (1988) examined business use of public libraries and found a willingness to pay on a 'levels of service' concept.

A low take-up of business services in the private sector is reported by Blagden (1980a) in a survey carried out at the British Institute of Management library. Results suggested that only 5% of the membership were using the service, but that that those using it were well satisfied.

In studies of the use of libraries/information units within organizations, a picture of low usage combined with low status emerges. Evidence of cutbacks and closures are reported by Singleton (1982) in a survey of use of

information technology and by the Technical Change Centre (1983) in a study of the effects of the recession on the supply of technical and commercial services within British industry. On the other hand, this study noted evidence of the growing demand for information and an appreciation of its value, as also did the Technical Change Centre's conference on 'Information for industry' (1984).

Problems of non-use or minimal use of company information services were reported by Slater (1980). In a survey of 173 librarian/information officer members of Aslib, 87% reported problems of non-use. With the growing importance of business information, Slater saw a communications gap between information services and their users, which reflected the low status and poor image of libraries in their organizations. In another survey (Slater, 1984a & b) Slater looked at non-use from the point of view of the potential user. In a survey of professional people whose work involved a need for information, she found reports of problems of getting hold of information coming equally from users and non-users of library services, suggesting that provision of a library service might have no effect on patterns of information use. Alternatively, however, raised expectations might have led to heavier demands.

An American research study by Culnan (1980) represents one of the few attempts to investigate the role of the

company library in the environmental scanning process described in 2.3 above. From a questionnaire survey of managers within two large organizations, she was able to show a role for the library as a Management Information System providing external information to complement the organization's computer-based internal information system.

2.6 DEVELOPMENTS IN INFORMATION TECHNOLOGY

With rapidly changing technology, those writers who paint a scenario of the future (Lancaster, 1978; Stonier, 1983) instance the development and growth of online computer services from the 1960s to the present day as one of the significant factors in the 'information revolution'. Online services, originally developed in science and technology, have, over the past few years, built up a substantial number of business and financial databases, so that the business area is currently seen as the major market for growth as a 'tradeable information sector' (Information Technology Advisory Panel [ITAP], 1983) and as an important source of external information for the organization (Hills, 1980).

There is agreeement that so far developments in information technology have been 'technology-led' and that a change is needed in ways of thinking about information (Hills, 1982) with more emphasis on users rather than systems (Wilson, 1981; 1987; Martyn & Flowerdew, 1983).

2.7 EFFECTS OF INFORMATION TECHNOLOGY ON EXTERNAL INFORMATION USE

Online computer databases and videotex services are now offering a range of external information services to industrial organizations which supplement the more traditional sources provided by libraries and information units and the informal sources used by managers. Guides to the whole range of business information services are provided by Campbell (1981) and Bakewell (1984), while commercial databases are described by Foster (1981), Webb (1984), East (1986), and Ryan (1988). Current information can be found in the quarterly Directory of online databases published by Cuadra Associates and in the Business information review from Headland Press.

Discussions on users of business information services are provided by Moores (1981), Duckitt (1984), Lester (1984) and Dutton (1986; 1989). Empirical research has been confined mainly to small-scale, unconnected studies, such as Houghton and Wisdom's investigation of users of non-bibliographic databases (1981), Methlie and Tverstol's study of the use of external services in Norwegian companies (1982), Eckersley and Rennie's research on the use of Datastream in City of London companies (1984), Withers' questionnaire survey of the use of information in company libraries (1985), Willis' study of database users (1986) and Withey's survey (1986) of the use of online

services by British Institute of Management members. More detailed analysis of end-users of external information services in financial organizations in the City of London and in the media is reported in the results of a British Library project on 'Information seeking in an information society' (Nicholas, Erbach & Harris, 1987a-c; Harris, Nicholas & Erbach, 1986). This project was based on case study material and found little evidence of awareness or use of external information services.

Studies of external information use reported here and in 2.4 have been conducted within smaller companies or have been based on small samples. There has been no large-scale project in this country which has looked at use of external information within larger organizations.

2.8 STRUCTURES FOR INFORMATION MANAGEMENT

With the growing importance of information and with developments in technology which have increased the accessibility of both internal and external data, writers such as Synott and Gruber (1981), Diebold (1984), Vickers (1984a-c), Cronin (1985) and Horton (1987) draw attention to the importance of establishing a corporate information policy. All point to the need for an acknowledgement of the central role of Information Management, with important consequences for organization structure and for the future development of computing departments and libraries. More recent literature is discussed in Appendix VIII.

CHAPTER 3 METHODOLOGY

3.1 SELECTING THE APPROACH

In order to select a suitable approach, an examination was made of the various methods used in previous management and information research studies, bearing in mind that this research project is focussed on the take-up and use of external information services and their value as sources of information to managers. Four main methods were identified, the diary approach, structured observation, interviews and questionnaires.

3.1.1 The Diary approach

This was the method chosen by Horne and Lupton (1965) for their study of the work activities of middle managers and by Stewart (1988) for her influential study of managers' jobs, first published in 1967. While appropriate for measuring how managers spend their time, it was considered inappropriate for measuring information use, where needs are not likely to arise as part of a regular pattern of events. As a method, it also lacks any form of qualititative judgment.

3.1.2 Structured observation

Mintzberg, whose book 'The nature of managerial work' (1973) includes an appendix setting out the different research methods that can be used in such a study, chose structured observation for his research into how managers spend their time. His detailed study of the work of five chief executives has provided invaluable insight into the manager's role, an understanding of which is essential to any study of managers' use of information. While providing in-depth material, the obvious limitation of this method is the small number of people that make up the sample.

A variation of this approach has been used in the information field in work with small firms. In a survey conducted from Suffolk Public Libraries (Trott & Martyn, 1986) forty-three local firms were encouraged to approach the Research Officer directly for information, so that data on information needs could be built up. A similar research project by the Centre for Urban and Regional Development (University of Newcastle-upon-Tyne, 1983) selected a small group of ten firms who, following an initial interview, were provided with a full information service and compared with a control group for whom this service was not provided. The use of structured observation in these examples has underlined the necessity for small firms to be provided with a counselling service before they can respond to questions on information need.

This essential need has also been identified by the Capital Planning Information studies (1982, 1985).

Structured observation would, therefore, be inappropriate for a study of larger firms which might already have their own information services. It is, however, extremely suitable for smaller, in-depth studies within a particular type of firm or locality.

3.1.3 Interviews

This is a familiar method in social science research and is used by several research studies in this field, either alone or in conjunction with questionnaires. Aguilar (1967) used interviews for his important research into environmental scanning. He supplemented these interviews with case studies of selected firms and found this combination provided ' a powerful two-pronged approach' (1967:215). Similarly, Keegan's research (1967; 1968; 1974) used structured interviews, as did Fahey and King's study (1977) of planning officers in large companies. Roberts and Clarke (1988) also chose the interview method and it is generally also preferred in small business studies such as those conducted by Capital Planning Information (1982, 1985).

As Mintzberg points out (1973:222), interviews can only show the manager's own perception of the job, as managers themselves do not give an objective view of their activities. One way round this in semi-structured

interviews is the 'critical incident' method where respondents are asked to give specific examples of a particular situation and how they handled it. This technique was one used by Aguilar, who found in his interviews a strong tendency to generalise and a difficulty in getting managers to concentrate on specific facts (1967: 215). On the other hand, if a highly structured approach is adopted, much valuable qualitative data will be missed.

The interview method alone was not thought appropriate for this research, because of the large number of managers from whom information was sought. However, it was recognised that a more rounded picture would be obtained if some interviews were carried out in conjunction with the main method chosen.

3.1.4 Questionnaires

Questionnaires have been a widely used method of gaining information on library use in British industry. For example, Slater (1980) sent a questionnaire to 239 Aslib members and received a 38% response rate in her study of non-use of library and information services; Singleton (1982) also used Aslib members for research into access and use of Information Technology in industrial libraries, mailing 375 questionnaires and getting a 62% return; the Technical Change Centre (1983) also sent out

questionnaires to 238 industrial information services and received a response rate of 50%.

Questionnaires have also been used in management research in the information area; Blagden (1980a) mailed 1000 British Institute of Management members in a study of information-seeking habits and had a 40% return; Fletcher (1983) used a sample of 200 firms from the 'Times Top 500' for a questionnaire on the take-up of marketing information systems in the UK, with a 58% return. In a Norwegian survey, Methlie and Tverstøl (1982) sent questionnaires to the marketing managers of 400 large industrial companies to ascertain usage patterns of external information services and had a 67% return. In the United States, Lewis (1982), mailing the presidents of 950 companies achieved a return of only 24%, whereas Rhyne (1985) mailing corporate planning or finance executives from 210 companies in the Fortune 1000 list in a study of information and planning had a 42% response rate.

Higher rates of return are achieved when the questionnaire is administered to a selected group within certain companies rather than by random sample; Hambrick (1981) achieved a 96% return with his questionnaires to 203 executives in 20 companies, looking at environmental scanning activities. Culnan (1980) had an 80% return from a sample of 450 managers in two large organizations where she was investigating managers' use of libraries.

As these figures indicate, the major advantage of the postal questionnaire is the breadth of coverage which it can achieve in a short space of time compared with any of the other methods outlined above. Return rates indicate that a questionnaire targetted at a specific functional group will generally achieve a much higher rate of return than that associated with a general mailing. On the other hand, the questionnaire is an imprecise instrument, liable to misinterpretation and ambiguity, and returns will often be biased in favour of those who already have an interest in the subject of the research. For this reason, the questionnaire needs to be followed up with a series of interviews or case studies to clear up any ambiguities and add qualitative data to the facts elucidated by the questionnaire itself.

Of the four methods which have been analysed, it was decided that combining a postal questionnaire with follow-up interviews of a representative sample was the most appropriate for this research, which aimed to gather data from a number of managers across a range of organizations, supported by selected case study material.

3.2 RESEARCH STRATEGIES

Having decided on the approach to be adopted, it was necessary to structure the research procedures and the following stages were identified:

- Pilot survey
- Review of pilot survey
- Design of main survey
- Review of main survey
- Case studies: interviews

These procedures are more fully described below.

3.3 THE PILOT SURVEY

3.3.1 Objectives

Before the main survey was launched, a pilot survey was carried out with fifty companies during May-July 1986. This was intended both to test the questionnaire and methodology and to provide some indication of trends in information use in advance of the larger-scale survey which was planned to follow.

The objectives of the pilot survey were as follows:

- To ascertain the relative importance of various areas and sources of external information.

- To investigate take-up and use of on-line and videotex services and their ranking as information sources.

- To identify characteristics of firms using on-line and videotex services as a basis for further detailed study.

3.3.2 Design of the questionnaire

The design of the questionnaire was discussed in advance with staff of the Computer Centre of Brighton Polytechnic in order to ensure straightforward analysis of results using the SPSS-X statistics software package. At the same time, discussions were also held with the Information Services Manager of a large local pharmaceutical company to ensure that the content and terminology were appropriate and understandable to the managers to whom the questionnaire would be addressed.

A copy of the pilot questionnaire and its covering letter will be found in Appendix I. The four-page questionnaire was intended to be quick and simple to fill

in and to provide information on the internal and external information services available to the organization. It was designed to allow analysis of results according to size and type of company, functional group and extent of use of electronic external information services, as well as to form a basis for comparison with previous research findings. The following elements were included:

a) Areas and Sources of external information
- lists of items to be rated for importance on a 4-point scale

b) Internal and external information services
- services available within the organization

c) Use of external information services in different departments
- grid to be completed

d) Company details

e) Space for comments

Respondents were also asked whether they would be interested to receive a report of the research findings. .

3.3.3 Selection of sample

There are already a number of studies of smaller British firms and their use of information services (see 2.4), for example those by Capital Planning Information (1982, 1985), by Roberts and Clarke from Sheffield University (1988), by the Centre for Urban Development and Research at Newcastle (University of Newcastle-upon-Tyne, 1983) and by Trott and Martyn at Suffolk (1986). All these studies indicate that use of external information

services such as videotex and online in smaller firms is extremely limited (see also 6.3.11). It was therefore decided to base this research only on larger companies and for this reason the 'Times 1000' was chosen as the sample base, as it offered a mixture of manufacturing and service organizations each with an annual turnover in excess of £43 million.

Fifty firms were selected for the pilot survey from the 'Times 1000' using random number tables. For the pupose of analysis, the firms thus selected were divided into two industry groupings (manufacturing and service) and three annual turnover groups (under £100 million, £100 million-£1000 million, over £1,000 million).

3.3.4 Identification of respondents

One problem encountered from the start was to whom the questionnaire should be addressed. Sending out a questionnaire of this type to 'The Managing Director' was thought unlikely to elicit a high response, whereas addressing questionnaires to the Librarian or Information Officer would produce replies only from firms where this particular function existed and would not reach those companies where information was organised in a different way. Addressing them to a particular functional head might similarly lead to bias in the response.

The number of people who might be responsible for information within a company was potentially high. It was

therefore decided for the pilot survey to make the initial approach by telephone, making contact, where possible, with the librarian or information officer and obtaining from them the name of the most appropriate person within the organization to whom the questionnaire should be addressed. The librarian or information officer was in this way the first point of reference in 21 of the fifty firms (42%), with a variety of other contacts in the firms where this function did not exist.

3.3.5 The pilot survey itself

Fifty questionnaires each with an individually addressed covering letter were posted to named contacts in early May 1986 and by the beginning of June, 21 replies (42%) had been received. A follow-up letter sent in June resulted in a further ten completed questionnaires being returned, giving a total of 31 usable replies (62%). Two questionnaires were returned unanswered. The use of named contacts had thus resulted in a good response rate for a postal questionnaire of this type.

3.3.6 Analysis of the results

An analysis of the results of the pilot survey is given in Appendix IV. About two-thirds of respondents were from manufacturing or construction, and the remainder from service industries. As a wide range of products and

services were represented, no detailed analysis by industry was possible.

Respondents fell into six broad functional categories:

	%
Corporate planning	23
Computer systems	19
Librarian/information officer	16
Finance	16
Management services	13
Sales & administration	13

A list of job titles appears in Appendix VI.

Numbers of respondents falling into each of the three annual turnover categories were:

	%
Under £100 million	45
£100 million- £1000 million	35
Over £1000 million	19

It was noted that random selection from the sample base produced a larger number of replies from companies in the smaller annual turnover group.

3.3.7 Review of the approach used in the pilot study

The diverse range of respondents illustrates the different ways in which external information is managed in different organizations and confirms the validity of the approach chosen, when compared with directing questionnaires to only one functional area within the firm. By having only one respondent from each company, however, the results may well not be representative of the

company as a whole, a point which is made by one respondent in his comments:

> "I have answered this questionnaire from the perspective of my department-the Marketing Intelligence dept - which, though the broadest information gathering point is not the only one in the agency. The Media and, possibly, the Planning and Research and Operations Research departments constitute specialised information gatherers and have their own data needs and sources. I am not able to answer on their behalf, however."
> (Marketing intelligence director, advertising agency)

In addition, by approaching only head offices, information sources within the divisions of a company were not being accessed, a further point made by one of the respondents:

> "Questionnaire answered on basis of head office information only. Operating companies in group would need to each be approached directly for the type of answers I believe you are after."
> (Manager, financial reporting, metals industry)

The wide number of industries represented among respondents precluded any detailed breakdown into industry groups, yet industry could be viewed as a key variable in information use. Certainly differences between industries would need to be taken into account in any detailed analysis, as one respondent explained:

> "I feel I should add a note about the peculiar dual role of a life company. For instance, we are interested in 'acquisitions and mergers' from the point of view of an investment institution rather than a trading company. Similarly we are interested in 'consumer attitudes' because of their effect on the share prices of companies in which we invest rather than consumer attitudes to our own product ie insurance. I fear that unless this dual role is distinguished aggregrate information for the whole survey may be misleading."
> (Planning manager, life insurance company)

Finally, the breakdown into size categories had resulted in almost half the respondents coming from the smaller of the three turnover groups, so that an analysis by company size would be liable to present a distorted picture.

3.4 THE MAIN SURVEY

3.4.1 Design of questionnaire

As a result of the analysis of the pilot survey, some changes were made to the questionnaire itself. A copy of the questionnaire and covering letter is given in Appendix II. The basic format remained the same, but the section on external information services was expanded to give an indication of frequency of use, and a new section on availability of information services either centrally or in divisions replaced the questions on company details, which could be obtained from other sources. To increase the information provided on use of individual databases, the most well-known databases were listed and respondents asked to underline those in use.

3.4.2 Selection of sample

From the pilot survey results and from other research, three key variables in information use were identified:

(a) Type of industry

(b) Function of respondent

(c) Size of company

The method of selecting a large number of companies with only one respondent from each had provided aggregrate information, but had not allowed the detailed breakdown by these three variables which would be of most use. It was therefore decided to adopt a more structured approach, still using the 'Times 1000' as a sample base, but selecting a more limited range of companies within certain industries and certain annual turnover groups. Questionnaires would then be sent to a number of different respondents within each company selected, including, where appropriate, both head office and company divisions.

(a) Type of industry

Four major industrial groups were initially chosen:

Pharmaceuticals
Construction
Electronics
Retail

These groups were chosen to give equal weighting to manufacturing and service companies which were operating across all the turnover groups identified in the pilot survey. The pharmaceutical industry was known as a heavy user of external information services (see 8.2.1), so that it could provide a basis for comparison with the other industries studied.

(b) Function of respondent

As has been noted earlier, the initial telephone approach to each company had resulted in a range of

respondents covering a number of different functional areas, but, with only one respondent from each company, replies might not be representative of the company as a whole. As it was clear from the results of the pilot survey that there was no one functional area with an overall responsibility for external information, it was decided to limit the number of companies surveyed, but to increase the number of respondents from each. This would lead to a more structured analysis of the variables of industry and functional type. Six categories of respondent were chosen:

Librarian/information officer
Corporate planning
Management services
Computer systems
Finance
Marketing

These followed the categories identified in the pilot survey, except that the 'Sales and administration' category was replaced by 'Marketing'. The lack of replies from marketing managers in the pilot survey had been surprising, as the survey results had shown the marketing department to be heavy users. It was therefore deliberately decided to seek out responses from this functional area for comparison with other groups.

(c) Size of company

As size of company appeared to be another important variable in information use, it was decided to adopt a more structured approach here as well. A total of twelve

companies were selected from each of the four industry groups, making 48 companies in all. Of these twelve companies, four were selected at random from each of the three annual turnover groups:

Under £100 million
£100 million- £1000 million
Over £1000 million.

The initial approach was again made by telephone to the librarian, information officer or other appropriate contact within each firm selected. A request was then made to supply the names of the most appropriate people to contact within each of the six functional groups.

An initial analysis of responses from companies selected showed such a gulf between heavy use in pharmaceuticals and a lower volume of use in other industries that comparison by industry was difficult. It was therefore decided to extend the survey to a further industry group which was also likely to show some external information use, and the oil industry, which had provided two of the extensive information users in the pilot survey was added to the list. The total number of companies contacted therefore increased from 48 to 60.

3.4.3 The main survey

Questionnaires were sent out to companies in the pharmaceutical, construction, electronics and retail industries in May - June 1987 and to the oil industry in

February - March 1988, in each case with follow-up letters one month after despatch.

Initial contact was made by telephone with a librarian or information officer in 19 of the 60 companies selected and with a variety of other contacts in the remaining 41. In 38 companies, names of contacts in the various functional groups were provided by this method, though the number of contacts in each company varied according to the particular company structure and not all functions were represented in each. A total of 153 questionnaires were sent out to named managers as a result of this approach. In the remaining 22 companies, it was requested that copies be sent centrally to one named contact for distribution and a further 120 questionnaires were sent out in this way. Overall, a total of 273 questionnaires were distributed to 60 companies.

Out of a total of 273 questionnaires, 138 replies (51%) were received, producing 122 usable questionnaires for analysis (45%). From 60 companies contacted, replies were received from 51 (85%), an average of 2.3 usable replies from each.

For questionnaires sent to named contacts (153), the response rate was 50% (77 usable replies) and for those sent centrally for distribution (120), 37% (45). This was a lower rate than achieved in the pilot survey, reflecting the wider range of respondents contacted.

Distribution of replies from questionnaire respondents was as follows:

By industry group

	no. of respondents	%
Oil	26	21
Pharmaceutical	31	25
Electronics	23	19
Construction	18	15
Retail	24	20

By functional group

	no. of respondents	%
Librarian/information officer	22	18
Corporate planning	13	14
Management services	10	8
Computer systems	22	18
Finance	24	20
Marketing	27	22
Other	4	3

By turnover group

	no. of respondents	%
Small (£43-99 million)	31	25
Medium(£100-£999 million)	38	31
Large (over £1000 million)	53	43

As the tables show, there was a good spread both by industry and functional group, but a higher representation of companies in the larger turnover group. Further analysis of respondents according to industry and company size is given in Appendix V, Tables A1-A2. A list of job titles is given in Appendix VI. In the case of four firms,

one respondent from each firm submitted a reply on behalf of the whole company.

From comments in the pilot survey and from the initial telephone contacts, it was apparent that, in some decentralised companies, insufficient information was available from the Head Office to fill in the questionnaire in respect of all functional groups. Suggestions to approach divisions within the companies directly were therefore followed up in the case of eleven firms and out of 122 replies 24 (20%) were from divisions, the marketing area being the most strongly represented.

3.4.4 Review of the approach used in the main survey

3.4.4.1 Comments from respondents

A number of respondents commented here, as in the pilot survey, on their inability to provide all the information requested on the questionnaire. Some made it clear that they were responding only on behalf of their own department:

> "I have answered from the perspective of an R & D information services manager but others in different parts of the organization may view the situation differently."
> (Head, Biomedical information services, large pharmaceutical company)

> "When analysing the answers to the previous questions, you should remember that I have answered only for the marketing division."
> (Marketing services executive, small pharmaceutical company)

> "I have reported my use in the acquisitions and investment area of the company, and the rest of the company to the best of my knowledge. Our use of information services may be more extensive than I have indicated."
> (Business investment manager, medium electronics company)

These comments in themselves demonstrate the validity of the approach to respondents in different functional groups. By comparing replies from the same company, it was possible to build up a composite picture of information use, though inevitably the picture is incomplete as the number of respondents from each firm varies. A fuller picture was obtained from the companies in the case studies. Though caution is needed in applying results from one or two respondents into a company-wide approach, the number of respondents is sufficient for valid comparisons to be made both by industry type and by functional group.

Other respondents commented that their organizations were too large or too decentralised for any one person to be able to answer the questionnaire fully:

> ".. even its Head Office here, is too large and departmentalized for any single person to respond to this questionnaire adequately. In question 3 and 4A I cannot answer for No - I would probably be wrong! Similarly in 4C I know which I have heard of and used but across Head Office and the divisions we potentially use anything which is a) available and b) cost-effective."
> (Planning manager, large pharmaceutical company)

> "The above is based on my knowledge of the potential and actual interest in this field, but while I provide central services, and have been responsible for reports etc in this field, we are a de-centralised group. Consequently there will be actual and potential applications of which I am unaware."
> (Systems manager, large construction company)

> "In a company of over 50,000 employees it is difficult to be in a position to give an overall view. My own experience embraces only a small number of HQ functional areas and while there is willing co-operation within divisions when particular information is required and sources are locally unknown, there is little structured in the way of a structured information service although this is likely to be developed."
> (Administration manager, large retail company)

This problem is a wider one than just methodology and has important implications for external information use, as it relates to company structure and the relationship between the central head-quarters of the firm and its divisions. This aspect is discussed in 9.6.

3.4.4.2 Non-respondents

Out of 138 replies received, 18 respondents from ten companies (13%) failed to fill in the questionnaire. One company refused to participate on the grounds that the information requested was confidential and in cases where one named respondent had been asked to distribute questionnaires, difficulties were reported in persuading colleagues to fill them in.

Individual reasons for non-reply were: no use made of external databases (4); company/departmental policy not to reply to questionnaires (2); work schedule too heavy (2);

no information to add to reply already sent in by colleague (2).

Of the remaining 46 non-respondents who had been sent personal copies of the questionnaire, 14 were selected by random sample for a follow-up telephone study to validate the findings of the survey. Of these, five could not be contacted, two had left the company, one promised to send a reply in the post, and six agreed to answer the questionnaire over the phone.

These six non-respondents gave as their reasons for not replying to the original questionnaire; no use made of external databases (2); questionnaire not appropriate to individual (1); no information to add to reply sent in by colleague (1); no reason given (2)

Out of sixteen respondents who had given individual replies for failure to fill in the questionnaire, either by letter or in the follow-up survey, six (37%) gave as their reason lack of use of external information services. The effect of this on the survey results is discussed in 4.13.

Apart from reasons of company policy or time, the other major group of non-respondents were those who felt that the questionnaire had already been adequately answered by another contact within the company; in all these cases the main respondent was the company librarian.

3.5 CASE STUDIES: INTERVIEWS

Having completed the analysis of the questionnaire replies, it was decided to investigate in greater depth by interviewing selected respondents on their use of external information. A total of eleven respondents from seven companies were chosen for this stage of the research:

1. Large pharmaceutical company
   - librarian at corporate headquarters

2. Small pharmaceutical company
   - librarian
   - marketing service executive

3. Large oil company
   - head of information unit
   - information officer

4. Small oil company
   - librarian
   - marketing manager

5. Large electronics company
   - information systems manager
   - trade marketing manager

6. Large retail company
   - manager, economic information department

7. Large construction company
   - systems manager

These respondents were selected to provide a mix of 'information providers' and 'information users' across the different industries and company sizes. Information providers included both librarians and information managers and systems managers, while information users were selected from the marketing area, which had been shown to be a heavy user of external information. An

initial approach was made by letter to the selected respondents, with a follow-up telephone call to arrange an appointment. All those approached agreed to be interviewed.

Interviews took place in April-June 1989. Each lasted approximately three-quarters of an hour and took a semi-structured form, with a basic set of questions which encouraged respondents to talk freely of their use of external information and used the 'critical incident' method to recall specific instances where information had been required. Different questions were asked of information users and information providers and the structure used for each is given in Appendix III. The case studies constructed from material obtained at the interviews are detailed in chapter 5.

CHAPTER 4 SURVEY RESULTS

4.1 INTRODUCTION

This chapter starts with a general analysis of the survey findings, followed by a more detailed breakdown by industry type, company size, functional group and extent of use of external information services. Attitudes to libraries and to videotex and online services are then considered separately in more detail. A copy of the questionnaire can be found in Appendix II.

4.2 AREAS OF EXTERNAL INFORMATION

In section 1 of the questionnaire, respondents were asked to rank fourteen areas of external information according to their importance to the organization, using a four point scale. These fell into four broad sectors (Market, Technology, Acquisitions & mergers, Environment), following earlier research work (see 6.2.1). Mean ranking is given in Table 1.

The areas receiving a mean rating above 3 (Competition, Market trends and Technological developments) were also in the first three places in the pilot survey. Similarly, Current affairs and Demographic trends occupied the last two places in both surveys.

Competition consistently scored 3 or above across all industries, functional groups and company sizes.

TABLE 1 Areas of information-mean rankings

	mean ranking (mean=2.77)
Competition	3.38
Market trends	3.21
Technological developments	3.04
Legislation	2.93
Customers & suppliers	2.86
Acquisitions & mergers	2.86
Economic conditions	2.82
Consumer attitudes	2.72
Government policies	2.72
Technical information	2.68
Cost/price structure	2.58
Introduction/deletion of products/services	2.39
Demographic trends	2.31
Current affairs	2.31

Tables 2 and 3 show the percentage of respondents rating areas as 'very important' with a score of 4, or 'not important' with a score of 1. While there is still a broad measure of agreement over the 'top three' areas, Acquisitions & mergers were also rated 'very important' by half the respondents and both Economic conditions and Legislation, while not among the areas rated 'very important' by the majority, were also among those least likely to be considered 'not important'. At the lower end of the ratings, Demographic trends and Current affairs

came last in both mean and importance ratings. Detailed analysis of these results will be found in 6.2.

TABLE 2 Areas rated as 'very important'

	no. of respondents (n=122)	%
Competition	69	57
Market trends	60	49
Technological developments	46	38
Legislation	40	33
Customers & suppliers	40	33
Acquisitions & mergers	50	41
Economic conditions	23	19
Consumer attitudes	42	34
Government policies	31	25
Technical information	25	20
Cost/price structure	29	24
Introduction/deletion of products/services	17	14
Demographic trends	16	13
Current affairs	9	7

TABLE 3 Areas rated as 'not important'

	no. of respondents (n=122)	%
Competition	4	3
Market trends	9	7
Technological developments	8	7
Legislation	7	6
Customers & suppliers	13	11
Acquisitions & mergers	21	17
Economic conditions	7	6
Consumer attitudes	22	18
Government policies	12	10
Technical information	16	13
Cost/price structure	16	13
Introduction/deletion of products/services	12	10
Demographic trends	32	26
Current affairs	24	20

4.3 SOURCES OF EXTERNAL INFORMATION

The list of sources given in section 2 of the questionnaire was based on earlier research but extended to include libraries and electronic information services. One of the main objectives of the survey was to see how these services were regarded by managers in comparison with other, more established, sources.

TABLE 4 Sources of information-mean ranking

	mean ranking (mean=2.66)
External personal contacts	3.16
Professional/trade journals	3.11
Newspapers & periodicals	3.01
Company personnel	2.97
Internal reports	2.77
Own library/information service	2.75
Professional/trade associations	2.66
Government reports	2.47
Other libraries/information services	2.42
Commercial databases	2.34
Videotex	1.64

As Table 4 shows, Own library/information service was in overall sixth position and Commercial databases and Videotex occupied the last two places in the ranking. In ratings for importance, however (Tables 5-6), Commercial databases were regarded as 'very important' by 25% of respondents, and Videotex by only 4%.

TABLE 5 Sources rated as 'very important'

	no. of respondents (n=122)	%
External personal contacts	46	38
Professional/trade journals	47	38
Newspapers & periodicals	37	30
Company personnel	43	35
Own library/information service	32	26
Internal reports	25	20
Professional/trade associations	19	16
Government reports	14	11
Commercial databases	30	25
Other libraries/information services	19	16
Videotex	5	4

TABLE 6 Sources rated as 'not important'

	no. of respondents (n=122)	%
External personal contacts	2	2
Professional/trade journals	5	4
Newspapers & periodicals	3	2
Company personnel	8	7
Own library/information service	13	11
Internal reports	5	4
Professional/trade assoc.	11	9
Government reports	18	15
Commercial databases	26	21
Other libraries/information services	14	11
Videotex	57	47

Personal sources (External personal contacts and Company personnel) and publications (Professional/trade journals and Newspapers & periodicals) emerge with the highest ratings. A very similar order was noted in the pilot survey (see Appendix IV). Analysis of these findings is given in 6.3.

4.4 INTERNAL INFORMATION SERVICES

Respondents were asked to indicate in section 3 of the questionnaire which internal information systems were available in their company; this was to determine both the level of availability and any correlation between the existence of internal information systems and the use of external information services which may be using the same technology. Results are shown in Table 7.

TABLE 7 Internal information services

	no. of respondents (n=122)	%
Library/information unit	98	80
Management Information System	90	74
Marketing Information System	63	52
Private viewdata	37	30
Online database for company inf	46	38

It was apparent from comments by three respondents that the terms used were not always readily understood and different replies from different respondents in the same

company also suggest some ambiguity. Other respondents may well have access to similar types of service which are known by different names. Analysis of results relating to company libraries is given in 6.3.6 and to other internal information services in 7.1.

4.5 INDIVIDUAL USE OF EXTERNAL SERVICES

Section 4A of the questionnaire asked respondents to mark external information services in use. The list of seven items included two videotex services (Prestel and Ceefax/Oracle), four database services (bibliographic, company information, financial and full-text) and also use of an external information broker/bureau. Results are given in Table 8. All seven services were available to 40% or more of respondents, with External broker more widely used than in-house services.

TABLE 8 Individual use of external services

	no. of respondents (n=122)	%
External broker	74	61
Financial	65	53
Company information	63	52
Prestel	60	49
Bibliographic	56	46
Ceefax/Oracle	51	42
Full-text databases	50	41

Usage of bibliographic, full-text and company information databases was higher than that recorded in the pilot survey. This increased use can be mainly attributed to high use within the pharmaceutical industry (see 8.2.1), but may also indicate increase of use during the period between the pilot and the main survey.

Respondents to the main survey were also asked to indicate whether these external services were being used 'often' or 'seldom'. Results are given in Table 9. Users of Prestel and Ceefax/Oracle were much more likely to use them 'seldom' rather than 'often', whereas usage of the other external services was more evenly divided between the two categories.

TABLE 9 Frequency of use of external services

	use often		use seldom		do not use	
	n	%	n	%	n	%
Prestel	7	6	53	43	61	49
Ceefax/Oracle	10	8	41	33	67	54
Bibliographic	32	26	24	19	63	51
Co. information	34	27	29	24	59	48
Financial	36	29	29	23	53	43
Full text	24	20	24	20	69	58
External broker	28	23	43	36	45	38

Individual use of external information services is analysed in 7.2.2.

4.6 COMPANY USE OF EXTERNAL INFORMATION

Respondents were asked in section 4B of the questionnaire to mark on a grid the departments in their organization where these external information services were being used. A total of 101 respondents (82%) completed the grid, either wholly or partially. By bringing together replies from different respondents within one organization, it was possible to build up a composite picture of information use. The number of mentions each department received on the grid was divided by the total number of mentions to give the percentage breakdown of departmental use shown in Table 10.

TABLE 10 Departmental use of external services

	no. of mentions (n=592)	%
Finance	130	22
Marketing	124	21
Library/Information unit	121	20
Corporate planning	81	13
Research & Devt	45	8
Management services	31	5
Other	27	5
Computer systems	18	3
Personnel	15	2

As the table shows, over 60% of total use within the organization came from three departments, Finance, Marketing and Library/Information Unit. Use by Computer Systems and Personnel departments was particularly low.

Table 11 shows the pattern of use made of individual external information services, according to the number of times each was entered on the grid by respondents from each company. Further analysis of departmental use will be found in 7.2.3.

TABLE 11 Company use of external information services

	no of mentions (n=592)	%
Prestel	68	11
Ceefax/Oracle	47	8
Bibliographic	78	13
Company information	120	20
Financial	100	17
Full-text	72	12
External broker	107	17

4.7 MAJOR DATABASES OR SERVICES IN USE

In section 4C of the questionnaire, respondents were given a list of the most popular databases or services in the various external information categories and asked to underline those services in use. In addition, they were asked to list other databases or services used. A list of services mentioned is given in Appendix VII, analysed by

industry group. The most frequently mentioned service overall was Dun and Bradstreet's company information database (54 mentions), ICC's company information database was also popular (29 mentions). Reuters' was the most frequently mentioned financial database (35 mentions) and Textline the most popular full-text service (28 mentions). The most popular host systems for access to bibliographic databases were Dialog (32 mentions) and Datastar (28 mentions). Further discussion on these results will be found in 7.3.4.

4.8 AVAILABILITY OF EXTERNAL INFORMATION SERVICES

Respondents were asked in section 5 of the questionnaire how external information services were made available in their organizations. 112 respondents (92%) filled in this section. Where more than two areas were ticked, the classification 'mixed' was used in the analysis. Table 12 shows availability.

TABLE 12 AVAILABILITY OF SERVICES

	n (n=122)	%
Central only	27	22
Divisions only	15	12
Locations only	15	12
Functions only	25	20
Mixed	30	25
Not given	10	8

Varying responses from different respondents within the same company suggest that this issue is not clear-cut. One respondent notes that services are available centrally 'in theory' and by function 'in practice'.

4.9 INTEREST IN QUESTIONNAIRE

39 respondents (31%) wrote comments on the use of external information in their companies and 62 respondents (50%) requested a copy of the summary report. These comments have been used in chapters 6-9, where the research findings are discussed.

4.10 ANALYSIS OF QUESTIONNAIRE RESULTS BY INDUSTRY GROUP

Survey results were analysed by the SPSS-X Breakdown procedure with type of industry as a variable, using the five groups identified in sending out the questionnaire (see section 3.4.2):

	no. of respondents	%
Oil	26	21
Pharmaceutical	31	25
Electronics	23	19
Construction	18	15
Retail	24	20

A discussion of these individual industries and their information profiles will be found in 8.2.

4.10.1 Areas of external information by industry group

Table A3 (Appendix V) gives mean ranking for areas of information by industry group. Highest mean scores were in the pharmaceutical industry (2.99), where 7 of the 14

areas were rated at 3 or more ('important'/'very important'). Competition and Market trends had mean ratings of 3 or above across all industries. Using a one-way analysis of variance with the SPSS-X Breakdown procedure, differences noted between industry groups were statistically significant at the 5% level or less($p \leq .05$) for the following seven areas:

i) **Technological developments:** rated most highly by the electronics industry (3.43) and by pharmaceuticals (3.35) ($p=.0058$)

ii) ***Legislation:*** *rated above 3 only in the* pharmaceutical industry, where it was in second place after Competition ($p=.0306$)

iii) **Consumer attitudes:** rated above 3 and in second place in the retail industry, but scoring under 2 in construction ($p=.0006$)

iv) **Government policies:** like Legislation, rated above 3 only in the pharmaceutical industry ($p=.0017$)

v) **Technical information:** rated above 3 only in the pharmaceutical industry ($p=.0301$)

vi) **Demographic trends:** received its highest scores in retail (2.71) and pharmaceutical (2.61) and rated below 2 in oil ($p=.0244$).

vii) **Current affairs:** rated most highly in pharmaceutical (2.61) and oil (2.46) and below 2 in electronics. ($p=.0156$).

4.10.2 Sources of external information by industry group

A detailed breakdown is given in Appendix V, Table A4. Highest mean rating were from the pharmaceutical industry (2.95) and from oil (2.83), each with five out of eleven sources rated at 3 or more as 'important'/'very important'. Lowest ratings were from construction (2.36)

with no area at 3 or more and three (Commercial databases, Other libraries and Videotex) rated below 2 ('not important'). Only one area (External personal contacts) was rated above 3 in the retail industry.

External personal contacts were rated at 3 or more by all industries except construction and were in first or second place in the electronics, retail and pharmaceutical industries. Videotex consistently scored below 2 and came in the final position. Significant differences ($p \leq .05$) were noted in relation to six of the eleven sources using a one-way analysis of variance:

i) **External personal contacts:** rated at 3.39 and in first or second place in oil and pharmaceuticals and at 2.72 in fourth place in construction ($p=.0353$)

ii) **Professional/trade journals:** high ratings in the oil and pharmaceutical industries ($p=.0448$)

iii) **Own library/information service:** rated above 3 in oil and pharmaceuticals, but below 2 in electronics ($p=.0000$)

iv) **Government reports:** rated most highly in the oil and pharmaceutical industries ($p=.0058$)

v) **Commercial databases:** rated above 3 in the pharmaceutical industry, at 2.81 in oil, but below 2 in construction and retail. ($p=.0000$)

vi) **Other libraries:** highest ratings from pharmaceutical (2.77) and oil (2.58) ($p=.0503$)

4.10.3 Internal information services by industry group

Figures are given in Appendix V, Table A5. Possession of libraries was almost universal in the oil and pharmaceutical industries, but they were available to less than half the respondents in electronics ($p=.0000$). Marketing Information Systems were significantly more frequent in the pharmaceutical industry (77%) and least common in retail (33%) ($p=.0338$).

In contrast, over two-thirds of respondents in each industry group had Management Information Systems. Private viewdata systems were reported in similar proportions across all industries. Online databases for company information, however, were more common in the pharmaceutical industry, where over half respondents had access.

4.10.4 External information services by industry group

Appendix V, Tables A6-A7 give individual use of external services and frequency of use. The proportion of respondents in the pharmaceutical industry using each of these services was higher for all but financial databases, where slightly higher use was noted in the oil industry. Apart from Ceefax/Oracle (52%) all services were being used by 70% or more of pharmaceutical respondents. In contrast, no service was being used by more than 48% of respondents in electronics or retail.

The most intensive use was being made of bibliographic databases by pharmaceutical respondents (88% of users using 'often') and of financial databases in oil (79% of users using 'often'). Few users in any industry were making frequent use of the Prestel or Ceefax/Oracle services. Outside the pharmaceutical and oil industries, numbers of 'often' users of any service were small.

Appendix V, Tables A8-A9 give company use of external information services by industry group using information from the grid in section 4B of the questionnaire. From Table A8, the pharmaceutical industry again emerges as the heaviest user, with a wide spread of services in use. The services most frequently used in the oil, construction and retail industries were the external broker, company information and financial databases. The electronics industry records the lowest use, with the external broker the most popular service.

Table A9 shows the heavy concentration of use of external information services through the library in the pharmaceutical industry, with 30% of mentions, compared with minimal library use in both electronics and construction, where Finance departments appear as the greatest users.

4.10.5 Availability of external information services by industry group

Appendix V, Table A10 gives a breakdown of the availability of services by industry. No significant differences were noted, but there was a preference for a 'mixed' approach in oil, pharmaceuticals and construction, for availability by functional area in electronics and by location in retail.

4.10.6 Interest in questionnaire by industry group

A table showing interest in the research project as measured by comments on the questionnaire and by the number of requests for copies of the summary report is given in Appendix V, Table A11. This shows less interest in the project from the construction and retail industries than from the other groups.

4.11 ANALYSIS OF QUESTIONNAIRE RESULTS BY COMPANY SIZE

Questionnaire results were next analysed using company size as a variable. Respondents were grouped by size of company using the classification based on annual turnover figures adopted when sending out the questionnaires (see 3.4.2c):

	no. of respondents	%
Small (£43-99 million)	31	25
Medium(£100-£999 million)	38	31
Large (over £1000 million)	53	43

Further discussion of the effect of company size on information use will be found in 8.3.

4.11.1 Areas of external information by company size

The table showing mean ranking by company size is given in Appendix V, Table A12. As in the pilot survey, ratings by small companies were generally lower, with a mean rating of 2.59 compared to 2.85 for medium and large companies. Only one area (Competition) was rated 'important' with a rating of 3 in small companies and the only rating below 2 in this table ('not important') was for Demographic trends in small companies.

Only in the case of the high rating of Technical information by medium size companies (3.03) was any difference statistically significant (p=.0055), but there were noticeable increases in rating by company size, particularly in relation to the Areas in the last two positions (Demographic trends and Current affairs).

4.11.2 Sources of external information by company size

Analysis of sources (Appendix V, Table A13) again shows general increase in ratings by company size. There were two sources for which results were significant:

i) **Own library/information service:** rated above 3 ('important') only by large companies (p=.0065)

ii) **Videotex:** highest rating from medium companies, but no group gave this source a score above 1.92 ('not important') (p=.0279)

There were also noticeable differences in the rating given to Commercial databases by small companies (1.90) compared to large (2.51).

4.11.3 Internal information services by company size

As the table shows (Appendix V, Table A14), there were significant differences by company size in relation to all but one of the five internal information services listed in section 3 of the questionnaire. In these four cases, availability increased significantly by company size and with the fifth (Private viewdata) there was also a noticeable increase. In particular, 96% of respondents in large companies had their own company library/information service, compared to 61% of respondents in small companies. Very few respondents in the smaller firms had either private viewdata or online databases for company information.

4.11.4 External information services by company size

For each of the external information services listed in section 4A of the questionnaire, the percentage of respondents reporting use increased with company size (Appendix V, Tables A15-16).

Differences were most marked in relation to:

i) Prestel (p=.0004)
ii) Bibliographic databases (p=.0009)
iii) Company information databases (p=.0059)
iv) Full-text databases (p=.0014)
v) Financial databases (p=.0015)

All these services were available to 50% or more of those from large organizations. Apart from the external broker, no one service was available to more than 50% of respondents from small or medium companies. Numbers of 'often' users of any service from small companies were particularly low.

4.11.5 Availability of external information services by company size

Appendix V, Table A17 shows availability of information services. Central or 'mixed' approaches were most common in large companies, availability by location or function preferred in medium size firms and approach by function in small companies. 26% of respondents from small companies did not answer this section of the questionnaire.

4.11.6 Interest in questionnaire by company size

Respondents writing comments on the questionnaire and those requesting a copy of the findings were fairly evenly divided across the three company size groups (see Appendix V, Table A18).

4.12 ANALYSIS OF QUESTIONNAIRE RESULTS BY FUNCTIONAL GROUP

As has been explained in 3.4.2 (b), questionnaires were sent out to respondents in six functional areas and replies grouped as follows:

	no. of respondents	%
Librarian/information officer	22	18
Corporate planning	13	14
Management services	10	8
Computer systems	22	18
Finance	24	20
Marketing	27	22
Other	4	3

Questionnaire returns were analysed using functional group as a variable and the results are reported below. In the case of four firms, a 'company-wide' response was given, with one respondent filling in the return on behalf of the whole company. Because so few firms were involved, these four questionnaire returns were omitted from the analysis by functional group.

4.12.1 Areas of external information by functional group

Appendix V, Table A19 gives ranking on the four point scale for areas of information. The highest mean ratings came from the librarian/information officer (2.95) and corporate planning groups (2.92), with the former rating eight out of the fourteen areas at 3 or more on the scale ('important'/'very important'), compared with only two areas so rated by marketing managers and four by systems respondents. In spite of the generally higher scores from

librarians/information officers, there were fewer statistically significant differences than with industry groups:

i) Customers and suppliers: rated most highly by systems managers (p=.0353)

ii) Acquisitions and mergers: highest ratings from librarians/information officers (3.23) and corporate planners (3.15) (p=.0311)

iii) Technical information: rated most highly by librarians/information officers and management services (p=.0072)

iv) Current affairs: rated most highly by librarians/information officers (p=.0065)

4.12.2 Sources of external information by functional group

Results of this analysis are given in Appendix V, Table A20. Librarians/information officers here had the highest mean score of any variable grouping (3.1). They had very significantly higher scores (p≤.01) for five sources:

i) Newspapers & periodicals (p=.0017)
ii) Own library (p=.0000)
iii) Government reports (p=.0003)
iv) Commercial databases (p=.0008)
v) Other libraries (p=.0000)

Higher scores in relation to Own library and Commercial databases were particularly marked. Numbers of respondents rating each source as 'very important' on the four-point scale are given in Appendix V, Table A21. This shows clearly the importance which librarians and information officers attach to their own libraries, to

commercial databases and to the main printed sources (Newspapers & periodicals and Professional/trade journals) compared to other functional groups. Own library and Commercial databases were each considered 'very important' by 73% of librarian/information officer respondents and the two printed sources by 68% and 64% respectively.

While librarians/information officers gave higher ratings to these sources, other groups rated External personal contacts, Company personnel, Internal reports and Videotex more highly. In the case of Company personnel, there were significantly higher ratings (p=.0301) from the finance and marketing groups, both of whom rated this source above 3 ('important'/'very important').

4.12.3 External information services by functional group

Results of this analysis are given in Appendix V, Tables A22-23. For the three 'non-financial databases' (bibliographic, company information and full-text) usage was significantly higher in the librarian/information officer group, the difference being most marked in respect of bibliographic and full-text databases which were being used by 91% of respondents from this group. In the case of financial databases, there was high use by finance managers (62%) and in systems (59%), but even here librarians had the highest percentage of users (73%). Use of Ceefax/Oracle was highest in finance (62%). Marketing respondents were generally the lowest users of these

services, although as was shown in 4.6, from company information on the questionnaire grid, marketing departments were one of the main users of electronic information.

4.12.4 Interest in questionnaire by functional group

Appendix V, Table A24 gives the percentage of respondents in each group making comments on the questionnaire and requesting a copy of the summary findings. The greatest interest came from librarians/ information officers and the least from finance respondents.

4.13 EXTENT OF USE OF EXTERNAL INFORMATION SERVICES

On the basis of replies to section 4A of the questionnaire on individual use of external information services, respondents were divided into four categories according to the number of services used. Those using five or more of the seven services listed were classified as 'extensive users', those using 3-4 services as 'medium users' , those using 1-2 services as 'limited users' and the remainder as 'non-users'. Numbers in each category are given in Table 13.

As seen in section 3.4.4.2, there were six 'non-respondents' who gave as their reason lack of use of external information services. All these were from smaller companies. This indicates that the survey results

may well have under-estimated the number of 'non-users' in the smaller turnover group (see also 8.3).

TABLE 13 Individual use of external services

	n (n=122)	%
Non-users	16	13
Limited (1-2 services)	30	25
Medium (3-4)	27	22
Extensive (5 or over)	49	40

Extent of use was used as a further variable in analysing the questionnaire returns using the SPSS-X Breakdown procedure. Results of this analysis are given in the following sections and there is further discussion of external information service use in 7.2.

4.13.1 Analysis of user groups

Tables 14-16 give a breakdown of these 'user groups' by industry, company size and functional group.

As the tables show, almost half the extensive users come from the pharmaceutical industry and just over two-thirds from large companies. These two factors together help explain the greater volume of use recorded in the main survey when compared with the pilot (see Appendix IV). Characteristics of extensive users are further discussed in 7.2.2.

TABLE 14 Individual use of external services - by industry

	Non-user (n=16)		Limited user (n=30)		Medium user (n=27)		Extensive user (n=49)	
	n	%	n	%	n	%	n	%
Oil (n=26)	1	6	7	23	7	26	11	22
Pharmaceutical(n=31)	0	0	3	10	6	22	22	45
Electronics (n=23)	5	31	9	30	4	15	5	10
Construction (n=18)	3	18	4	13	6	22	5	10
Retail (n=24)	7	44	7	23	4	15	6	12

TABLE 15 Individual use of external services - by company size

	Non-user (n=16)		Limited user (n=30)		Medium user (n=27)		Extensive user (n=49)	
	n	%	n	%	n	%	n	%
Small (£43m-£99m)	7	44	13	43	8	30	3	6
Medium (£100m-£999m)	6	37	10	33	9	33	13	26
Large (over £1000m)	3	19	7	23	10	37	33	67

TABLE 16 Individual use of external services - by functional group

	Non-user (n=16)		Limited user (n=30)		Medium user (n=27)		Extensive user (n=49)	
	n	%	n	%	n	%	n	%
Librarian/inf.off.	0	0	1	3	3	11	18	37
Corporate planning	1	6	3	10	3	11	6	12
Management services	1	6	6	20	2	7	1	2
Systems/computing	5	31	7	23	5	18	5	10
Finance	2	12	4	13	6	22	12	24
Marketing	7	44	8	27	6	22	6	12
Company	0	0	1	3	2	7	1	2

4.13.2 Areas of external information by user group.

Appendix V, Table A25 gives mean ranking for areas of information. Extensive users tended generally to give higher ratings, most noticeably in the case of Current Affairs, rated at 2.53 compared to 1.94 by non-users.

4.13.3 Sources of external information by user group

Appendix V, Table A26 gives mean ranking for sources of information. Mean ratings increased with extent of use and significantly higher ratings were noted for:

i) **Own library/information service:** rated above 3 ('important'/'very important') only by the extensive user group (p=.0000)

ii) **Commercial databases:** rated at 3 by extensive users and below 2 ('not important') by non and limited users (p=.0000)

iii) **Other libraries/information services:** rated at 2.75 ('fairly important'/'important') by extensive users (p=.0122)

The fact that 37% of extensive users are from the librarian/information officer group means that these results must be considered alongside those for functional groups. Attitudes to libraries and commercial databases by their users are analysed in 6.3.6 and 6.3.11.

4.13.4 Internal information services by user group

Replies to section 3 of the questionnaire on internal information services were analysed by user group to see if there was any correlation between users of services provided externally and availability of internal services which often used the same technology. Results are shown in Appendix V, Table A27. For all five services, availability of internal services increased by extent of use of external services. In particular, 92% of extensive users had libraries compared to 56% of non-users (p=.0079), and 53% had online databases for company information compared to 6% of non-users (p=.0128). These figures need to be considered in conjunction with data relating to company size, as 67% of extensive users were from large organizations and the pattern found here mirrors closely that in Table A14 on Internal information services and company size (see 4.11.3). Internal information services and their relationship to external services are discussed in 7.1.

4.13.5 External information services by user group

A breakdown of external services by user groups is given in Appendix V, Table A28. Over half the limited users were using an external information broker, with Prestel and financial databases next most popular. Among the limited and medium user groups, bibliographic and full-text databases were the least used.

Appendix V, Table A29 gives frequency of use of the various services. The classification into user groups relates to the number of external services and not to intensity of use; it would be possible, for example, for a 'limited user' to be using one or two services on a regular basis, while an 'extensive user' may be making more spasmodic use of a wider variety of external services. This does not, however, appear to be the case. Table A29 shows that, apart from the use of financial databases among medium users, very few limited or medium users are making frequent use of any service. On the other hand, among extensive users, a higher proportion of users report use 'often' rather than 'seldom' for all services apart from external information broker, Prestel and Ceefax/Oracle.

4.13.6 Availability of external services and user group

Appendix V, Table A30 shows availability of external services within the company, broken down by user group. Few non or limited users had a central information

facility and 31% of non-users failed to reply to this section of the questionnaire. Among medium and extensive users, a central or mixed approach was preferred.

4.13.7 Interest in questionnaire and user group

As Appendix V, Table A31 indicates, all user groups made comments on the questionnaire and there was interest in receiving a copy of the summary report from both limited, medium and extensive users.

4.14 ATTITUDES TO LIBRARY, VIDEOTEX AND COMMERCIAL DATABASES

Further analysis of the questionnaire returns was carried out to determine the attitudes to company libraries and commercial external information services by respondents who had reported access to these facilities. Analysis was carried out using the SPSS-X Crosstabs procedure and applying the chi-square test for statistical significance.

4.14.1 Attitudes to libraries

Ratings for 'Own library' as a source of external information were examined in regard to respondents who had reported access to a company library as an internal information service in section 3 of the questionnaire . Analysis of the results by the four variables of industry group, company size, functional group and use of external

information services is given in Appendix V, Tables A32-35.

Respondents in the oil and pharmaceutical industries were much more likely to rate their libraries as 'very important', though this would be partly accounted for by the number of librarian/information officer respondents in those industries. 73% of librarians/information officers rated their libraries as 'very important' compared to less than a third of respondents from any other group. The importance attached to libraries was affected by company size, and also by extent of use of external information services. Attitudes to libraries are further discussed in 6.3.6.

4.14.2 Attitudes to videotex

A separate analysis was made of ratings for videotex as a source of external information by users of Prestel and users of Ceefax/Oracle. (see Appendix V, Tables A36-37). Out of seven respondents who were using Prestel 'often', only one (14%) rated videotex as 'very important' and out of 53 using it 'seldom' only two (4%) did so. 36% of those using it 'seldom' gave it a 'not important' rating. Similarly with Ceefax/Oracle, only two out of ten 'often' users (20%) and one out of 41 'seldom' users (2%) regarded videotex as 'very important'. 44% of those using Ceefax/Oracle 'seldom' rated videotex as 'not important'.

More discussion on the use of videotex will be found in 6.3.12.

4.14.3 Attitudes to commercial databases

Appendix V, Tables A38-41 give an analysis of ratings for commercial databases as a source of external information by users of bibliographic, company information, financial and full-text databases. Apart from financial databases, more than half those respondents who were using these services 'often' rated commercial databases as 'very important' and very few users gave a 'not important' rating. Those using financial databases gave a slightly less favourable rating, with 39% of frequent users considering commercial databases 'very important'.

CHAPTER 5 CASE STUDIES: INTERVIEWS

5.1 INTRODUCTION

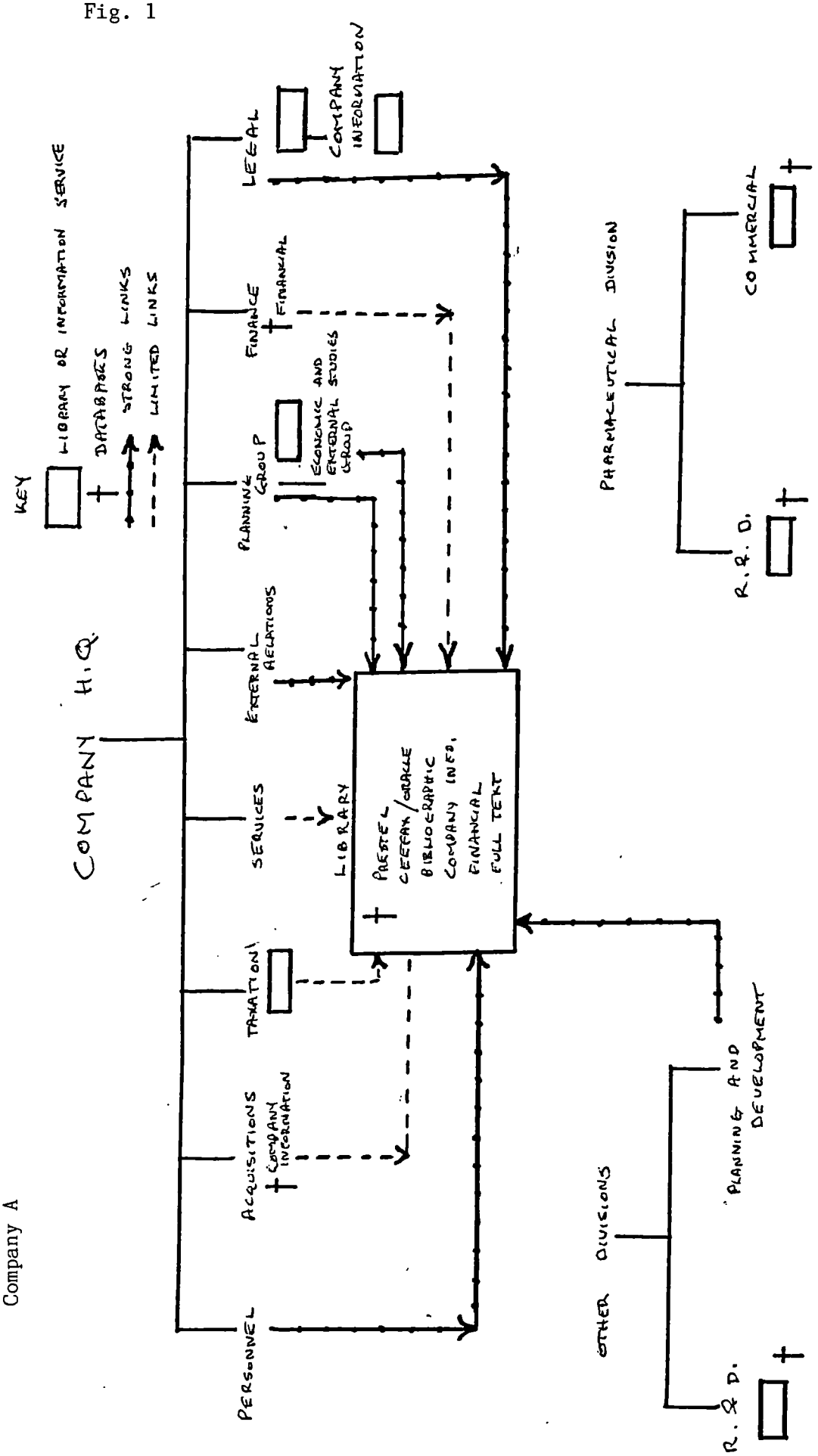
In this chapter, the results of the case study interviews are presented. A description of the approach adopted can be found in 3.5 and the interview schedules used for information users and information providers are given in Appendix III.

5.2 COMPANY A: CASE STUDY INTERVIEW 1

5.2.1 Introduction

Company A is a giant multinational with a large pharmaceuticals division. Questionnaires were returned by the Librarian in the London headquarters and by a manager from the central Planning department and a financial controller, also from the Librarian and Corporate Planning Manager within the Pharmaceuticals division. The interview was held with the Librarian in the Headquarters Services division, who was able to provide information on provision within the company.

Fig. 1



Company A

5.2.2 Interview with librarian

A) Place of the library in the company structure

As the diagram (figure 1) shows, the library forms part of the Services department within the company headquarters. Its main users are drawn from the Planning department and its Economic and External studies group, and from the Legal, Personnel and External relations departments. Finance, Taxation and Acquisitions are less frequent users. Although little use is made of the library by other parts of the Service department, its placing within this central section rather than within a particular group is seen as an advantage as it makes funding more secure.

Within company headquarters, there are also small libraries within some individual departments, for example an economics and statistical collection in Planning and separate collections in the Taxation and Legal departments. These have mainly developed from the amalgamation of private collections held by individual members of staff. There is also a separate Companies Information section within the Legal department, which collects statistics and company annual reports.

Within the company divisions, as figure 1 shows, libraries generally form part of the R & D department and provide a technical information service. Of these division libraries, Pharmaceuticals is the best supported, with a

staff of 12 and a separate commercial library. In other divisions, where the libraries are not funded to provide management information, economists and analysts working within them will tend to come direct to the HQ library.

B) Library services and use

The library has a central purchasing function for all print materials. Some departments, for example Finance, are using the library mainly to consult newspapers and printed sources. Others, in particular, the Economics and External Studies group within Planning are heavy users in connection with work on long-term projects such as researching new markets.

The HQ departments are making good use of the library and it had a good reputation. The Librarian was conscious of the need to maintain a high profile by sending out regular lists of new books and arranging visits for new members of staff. It was noticeable that some individuals were much heavier library users than others and this was more often due to personal interest than to the actual job held. When a person leaves a job, the successor may have a totally different attitude to library use. The Librarian felt that more people could be reached if the library adopted a more pro-active approach, but it would then need more resources to cope with the increased demand.

C) Use of external information services

The library has a central co-ordinating role in payment for online services, to take advantage of maximum discounts. All costs are charged back to departments.

The company is one of the country's largest users of online services and much of its information need is met from computer sources, with a very wide range of external services available. The Librarian felt that most information requests were coming through the library, so that managers would not necessarily know or care that the answers had come from computer databases, so long as the information given was accurate and on time.

There were some examples of direct access to computer databases, for example by Finance and Acquisitions where information might be too sensitive to reveal. Self-access is encouraged where there is enough need to make it worthwhile to master a particular database. In general, however, people prefer to leave searching to the library.

From the comments made on the questionnaire by the Librarian from the Pharmaceuticals division, it was apparent that here too people prefer to delegate database searching to the library, even though many departments had direct access to external databases through the division's information service on Datastar.

D) Other sources of information for managers

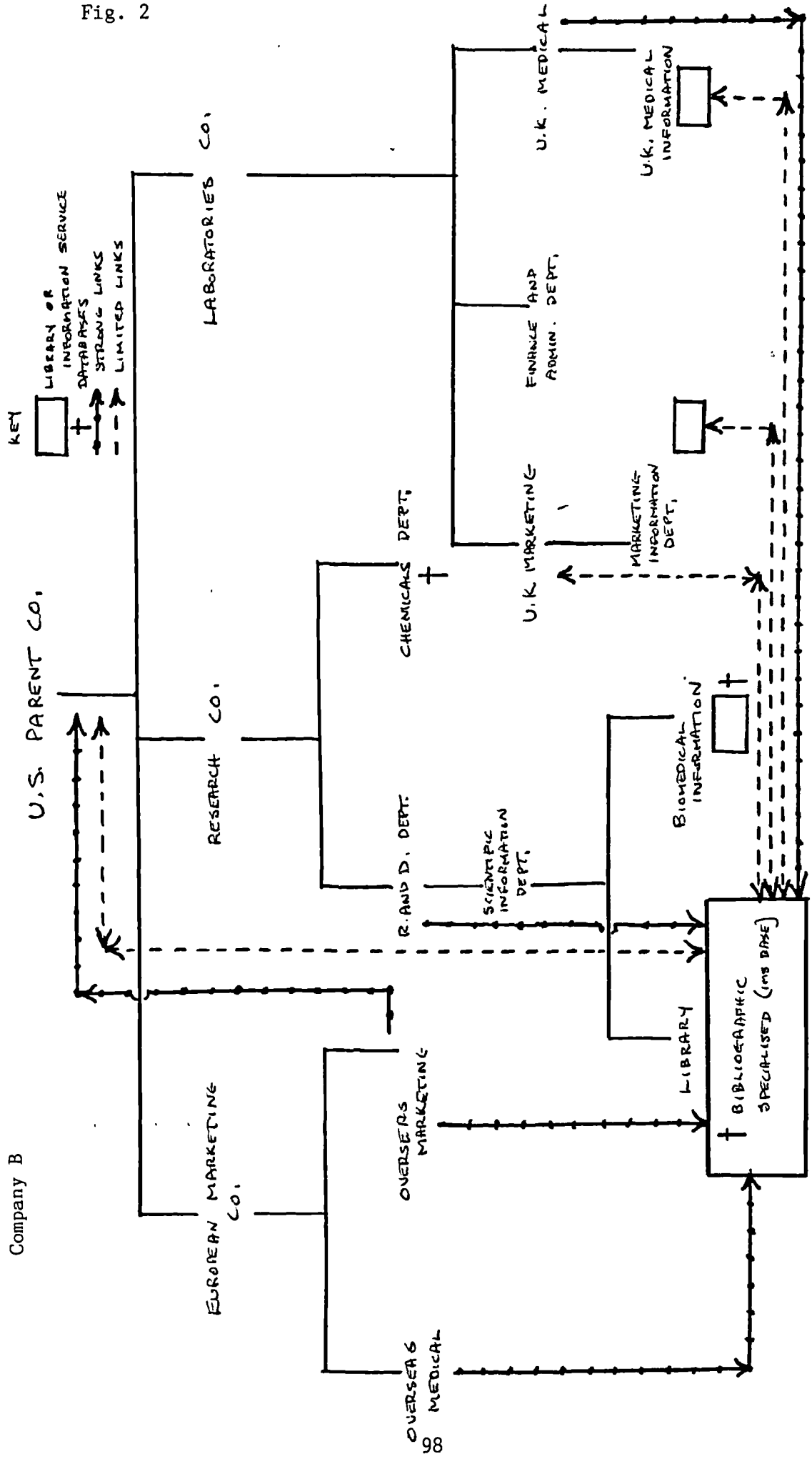
Personal contacts are regarded as very important, especially at top management level, where managers will have board-level contacts with other companies.

5.3 COMPANY B: CASE STUDY INTERVIEWS 2-3

5.3.1 Introduction

Company B is a small pharmaceutical company with its head office and parent company in the United States. Although the company is very large globally, its operation in this country is comparatively small. As the diagram (figure 2) shows, it operates as three separate companies, all based in one location, Research, Laboratories and a European marketing company. Questionnaires were returned by the Librarian in the Research company and by marketing executives from the Laboratories and the European companies. Interviews were held with the Librarian and the European Marketing Services Executive, thus giving both a librarian's and a user's perspective on information use within the companies.

Fig. 2


Company B
U.S. PARENT CO.
RESEARCH CO.
LABORATORIES CO.
EUROPEAN MARKETING CO.
KEY
LIBRARY OR INFORMATION SERVICE
DATABASES
STRONG LINKS
LIMITED LINKS
CHEMICALS DEPT.
R. AND D. DEPT.
SCIENTIFIC INFORMATION DEPT.
U.K. MARKETING
MARKETING INFORMATION DEPT.
FINANCE AND ADMIN. DEPT.
U.K. MEDICAL
U.K. MEDICAL INFORMATION
BIOMEDICAL INFORMATION
LIBRARY
BIBLIOGRAPHIC SPECIALISED (ims BASE)
OVERSEAS MARKETING
OVERSEAS MEDICAL

5.3.2 Interview with Librarian

A) Place of the library in the company structure

The library forms part of the Scientific Information department within the R & D department of the Research company. Its position is shown in the structural diagram (figure 2). The primary function is to serve the R & D and medical departments by providing scientific and medical information and giving access to published product literature.

Because of the division into separate companies, the Librarian found his service being widely used not only by the R & D staff for whom it was intended, but also by members of the UK marketing department in the Laboratories company and by overseas medical and marketing staff in the European company. The library's information bulletin, though written for R & D staff, was circulated widely and generated requests for published literature on company products which could not easily be met from any other source. The Librarian felt that this 'non-R & D use' was not generally known or appreciated by the company and was not recognised in the library's funding and staffing levels. Its funding level was, however, felt to be more secure within the R & D department than it had previously been as part of the Medical department. This was because R & D costs could be off-set against tax.

The group of companies also operate specialised information services. In particular, there is a Marketing Information unit within the UK marketing department. While requests for published literature come to the library, requests for information, for example on market share, would go to the Marketing Information department. Within the Patent and Chemical departments there are also specialised information units, and a separate section within the Scientific Information department itself provides biomedical information. The UK medical information section answers queries from general practitioners and the public.

The US parent company may seek local information through the library and the case study library here may use the parent company in the same way. The library's role is to a large extent influenced by the relationship between the UK companies and the US parent company. R & D, marketing and product policies are determined by the parent company and this affects the range of material which the library has to provide.

B) Library services and use

The library has a central role in buying books and journals on behalf of other departments and housing them in the library if required. There is a reference section for people to consult, for example to find out background information on a particular country when entertaining

overseas visitors. A cuttings service from the main daily newspapers is provided for the company's senior managers.

The library also supervises the company's product files and keeps them up-to-date. The Librarian felt that maintaining these files was really a marketing function and detracted from the library's main responsibility to support R & D research into new products. He felt that the task had been given to the library because no-one else wanted to do it.

There appeared to be gaps in the company's information provision which the library was filling by default. The circulation of its information bulletin and its housing of the product files was creating a heavy demand from a large group of users in European and international markets for whom it was not primarily intended.

C) Use of external information services

The Scientific Information department of which the library is a part is responsible for the provision of online services on a company-wide basis. There is a centralised budget and costs are not charged back to departments. Only bibliographic and specialised databases are available and the company has not yet considered use of any other type of external information service.

Bibliographic databases are used regularly with access via Dialog or Datastar, with the main use for specialised

searching of medical and scientific databases. One or two searches a year are done to get background information on a particular company.

The pharmaceutical database IMSBASE is available but not much used. This service would generally be accessed through the Marketing Information unit or directly from the US parent company.

The Chemicals department does some direct searching of CAS Online, but the Librarian found people preferred to come to the library. He would like to encourage end-users to do simple searches for themselves to save staff time, and he would be willing to train people in search techniques, but had never been asked. Shortage of terminals was another factor discouraging widespread use.

The library is not at present automated, so much time is taken up with clerical work. If the current bid for a corporate information retrieval system is successful then end-users would gain easier access to on-line services and usage would possibly increase. This new database would also cover internal reports, although the Librarian envisaged problems here in crossing departmental boundaries. The Librarian saw departmental boundaries in the company as a very real obstacle to information flow, giving rise to a large amount of costly duplication.

The Librarian also saw the need for more co-operation with the parent company in the United States, for example

by producing a world-wide corporate database. Access to the product files in particular was highly unsatisfactory. The library only has author access and needs to go through external databases to pick up references to answer subject enquiries. The literature on company products has grown tremendously in recent years and maintaining this collection is now seen as a major problem.

D) Other sources of information for managers

The library has informal contacts with other local libraries, including the public reference library and has corporate membership of relevant scientific bodies.

The Librarian had little contact with senior managers outside R & D. Requests might well be 'passed down the line' from the top, but the library would not know where they originated.

The library's responsibility was mainly for published literature but by the time information was published it might be four to five years out of date. If a manager wanted up to date information then the Marketing Information unit would be able to get hold of it much more readily than the library by getting on the phone to their numerous contacts in other companies. Much general marketing information is held only by the US parent company.

5.3.3 Interview with Marketing Services Executive, European company

A) Introduction

The place of the European company in the organizational structure is shown in figure 2. The company deals with the marketing of company products in European countries. Its stage in the operation comes between the R & D research that the Library was mainly supporting and the actual marketing of the product in the country itself. Once the product has been released, the Marketing Services Executive is responsible for working out where best to manufacture and what price to charge to the operating units. Sales and advertising staff then take over the actual product launch.

The manager described the company's information structure as an inverted triangle, where specific details had to be passed down to operating managers and information synthesised up to the Head Office in the United States.

B) Areas of external information of interest

External information was seen as very important, particularly statistical information on selling prices or prescription reimbursement rates in the various European countries, used for determining pricing policies for products in Europe and for export. All areas on the

questionnaire had been marked as 'very important', except for Current affairs and Economic conditions ('important') and Customers and suppliers ('not important').

The information of interest was industry and product specific. The manager sought out information to answer specific problems and there was little concern with more general financial or corporate considerations. It was the responsibility of the US parent company to analyse this type of data. Similarly, monitoring the politics and economics of the countries concerned would be the task of the local managers, although the Marketing Services Executive would expect to be kept informed by them of any developments that might have wider implications.

The sort of external information that had proved more difficult to obtain was the data needed when arranging to export products from one country to another, such as export and import duties and rates or taxes on prescriptions. The Marketing Services Executive would go to the operating units in the countries concerned if he needed information of this type.

C) Sources of external information used

In the questionnaire return, this respondent had ranked Newspapers and periodicals, Professional/trade journals and Commercial databases as 'very important' and Own Library/information unit as 'important'.

As the main interest was in industry specific information, the main source was IMS (International Medical Statistics) and its various services. The pharmaceutical industry was the best supplied of any industry with marketing information, with statistical projections for over fifty countries available for purchase from IMS. The company buys in IMS printed manuals on the audit sales of pharmaceutical products in Western Europe with information on sales units, cash value, prices, products, product launches etc. These manuals are kept in the Marketing Services Executive's own office. Other industry publications used are SCRIP, IMS Market letter, pharmacopeias and drug manuals.

External personal contacts within the industry are another important source of information, as are the local managers and operating units who are providing information on local conditions and answering specific queries relating to their countries.

The Marketing Information unit would provide information on local prices, but when more specific information is required, a market research survey would be commissioned.

D) Use of company library

The library was not being heavily used. Its main use was to consult reference material such as Pharmaprojects

which contained details of new drugs and clinical R & D trials.

E) Internal information services

The company's own product database was being used alongside the IMS MIDAS database to provide a Marketing Information System for internal and external information.

F) Use of external information services

The manager was using the IMS Midas database which covers European pharmaceutical sales. He was accessing this regularly through the US parent company by electronic mail and saw no need for it to be available to him in-house, as he found this method of access very convenient and quick. He had never used the pharmaceutical database IMSBASE which was available in the library, but he had occasionally asked the Librarian to do online searches on companies that were potential acquisition candidates.

Although his experience of MIDAS had led him to give a high ranking to commercial databases, he considered more general databases to have very little relevance and had never considered using them. The main use he saw for them was to provide details of a country's political and economic background, but this type of data was already being supplied to him direct by local managers in the countries concerned.

5.4 COMPANY C: CASE STUDY INTERVIEWS 4-5

5.4.1 Introduction

Company C is a giant multinational oil company. The company operates on a series of business streams and interviews were held with two members of the Information Department within the Exploration stream, the Information Officer and Head of the Information Unit. This department was currently developing a database which combined external and internal information and this formed a primary interest in the interview with the Head of the Information Unit. A questionnaire had also been returned by a market analyst within the Commercial department.

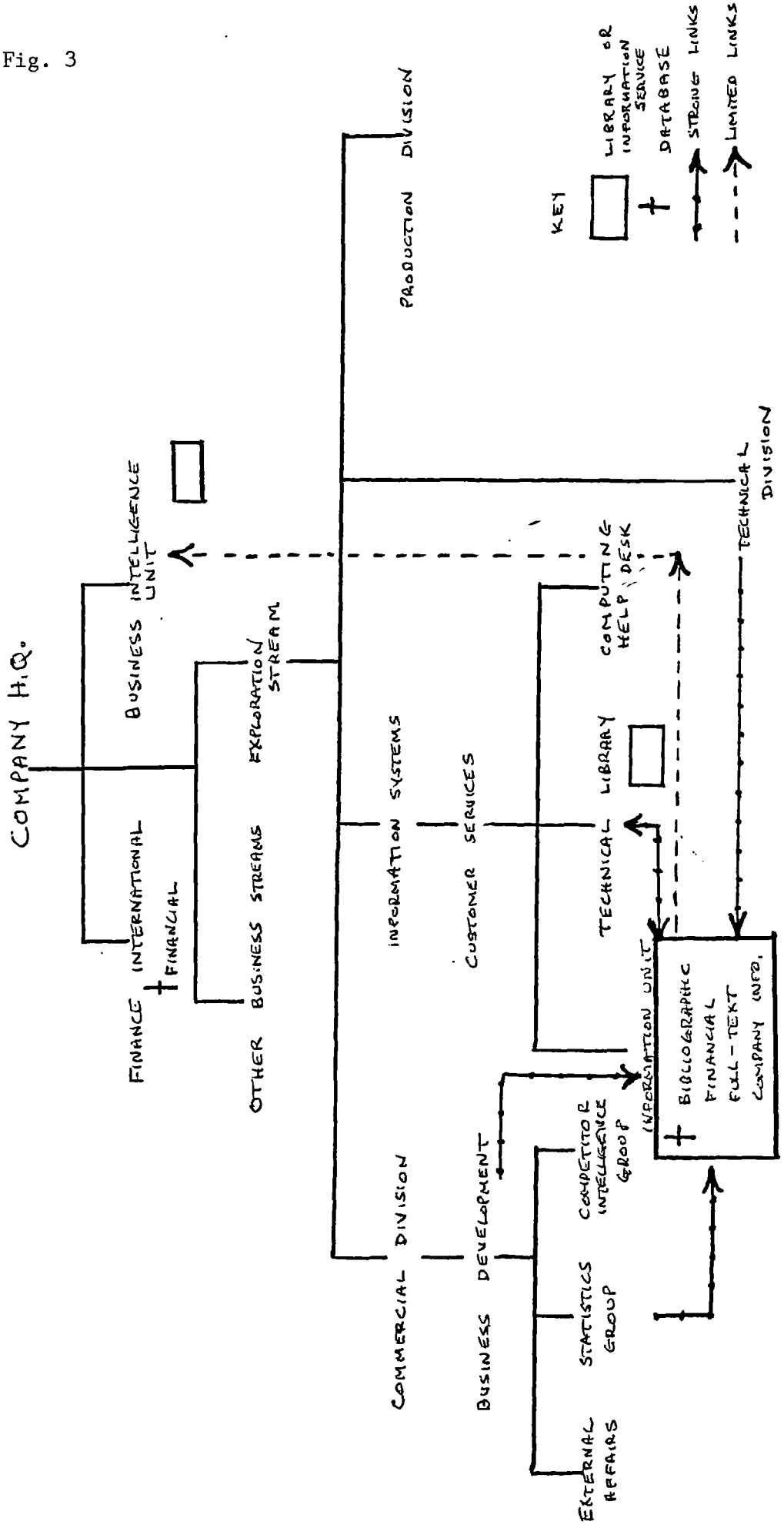
5.4.1 Interview with the Information Officer

A) Place of the Information Unit in the company structure

As the diagram shows (figure 3), the Information Unit is part of the Customer Services division of the Information Systems department. The Library and the Computing Help Desk are within the same division. The Unit's main users are geologists and other technical staff from the Technical division and corporate planners, analysts and economists from the Statistics and Competitor Intelligence Groups within Business Development.

While the Library deals with the technical side of Exploration, the Information Unit deals with internal and

Fig. 3



Company C

external business information and 80% of its information comes from internal databases. It has a long established role in searching for technical information, for example on oil rigs and the geology of a particular area, but its business and commercial side has grown up only in the last five years, since the setting up of a Competitor Group within the company and the recognition that many types of decision need business as well as technical information.

There is a close relationship with the library, which is housed near the Information Unit and is part of the same department. Since the library has a more specialised function, commercial and business requests will be passed to the Information Unit.

For historical reasons, there is a commercial central library which also supplies business information, now called the Business Intelligence Unit. This Unit has a back-up and co-ordinating role. It controls budgets and issues passwords for online services, so that advantage can be taken of maximum discounts, and it arranges demonstrations of new databases. As all services within the company are now charged out, any use of the Business Intelligence Unit would have to be paid for. In general, it is not used much within the Exploration stream, which relies on its own information services.

B) Information Unit services and use

The Unit buys in Scout data on tapes from Petro-consultants and loads them into the internal system, using the Ingress system to make the results more user-friendly. This involves much in-house work manipulating the statistical output and requires the Unit to write its own programs. North American data providing both technical and competitor information not covered by the Petrocons database is bought in-house and loaded on to a database in the United States.

The Information Unit scans newspapers and technical journals for competitor information. The results are fed into the company's private file facility called Compact on the Profile database system and are then available for searching only within the company. This system has now been running for four years and is available through terminals to anyone in the company at home or abroad.

The system was set up with help from the Competitor Intelligence Group. It replaces the earlier system where information on competitors was cut out from newspapers and pasted in scrapbooks, so that a newspaper report that named sixteen separate companies would need to be pasted into sixteen separate files. The indexing on Profile has therefore made this type of information much more readily accessible with much less manual effort.

Recent data from news cuttings is also downloaded and sorted by area through the Compact database. The results are then printed and distributed in weekly bulletins.

The Unit itself has a high profile mainly because of the Compact database, but the Information Officer felt there should be more user awareness of the other services on offer. For example, the Unit would like to encourage more use of the profiles service on Dialog, providing individually tailored up-dating on particular topics. Few people were aware that this service was available to them.

C) Use of external information services

In addition to its specialised Petrocons database, the Unit was making heavy use of bibliographic databases. The company was one of the first in the City to have Dialog to link with its Tulsa oil database in the US and Dialog remains the most well-used password. The Dialog profiles service is used to provide up-to-date North American news.

The IP Sharp Reuters database is used heavily and information on share prices, exchange rates and oil prices are extracted daily to add to the company's Management Information System. The company's financial department is a very large subscriber to Reuters and Telerate, with Dun & Bradstreet being used for credit checking.

The Unit uses the FT Business Information service for requests it cannot deal with from its own resources. They

find this service slow and consider it has become a victim of its own success. Disclosure provides a more rapid service, especially for annual reports. Alternatively, another company will be approached directly for specific information.

Textline was the service which end-users most requested. It is often the only one that they have heard of and the fact that it provides abstracts rather than references is an additional attraction. The Information Officer felt this was a blinkered view and that there may well be better sources of information available to meet end-users' information needs. People tend to ask for a specific service like 'Compact' or 'Textline' instead to saying what type of external information they want.

With the company's internal databases, end-user searching is encouraged. Forty to fifty people search the internal Compact database of competitor information themselves from terminals on their desks. The Petrocons database is also being searched by end-users, as word gets around that it too is simple to search.

End-user searching of external databases is controlled through the payment system. People come to the Information Unit with their requests because otherwise their departments would have to meet the costs. Over the past year, there has been a greater awareness of external information, helped by the introduction of the Global

Report system described in the next interview. Most people now have a terminal on their desk and use the electronic mail service, so that there are more people who are familiar with the use of computers.

D) Other sources of information for managers

'Old boy networks' are widespread, especially among the Competitor Intelligence group. The Unit once thought of setting up a 'Contacts' database, but realised this would be a very difficult task. It was felt that people liked to have a name to contact rather than passing a request straight to the Information Unit. Often a request will end up in the Unit, having perhaps started with the Chairman and been passed down by personal contact from department to department. Examples were given where a number of managers had approached the Information Unit seeking the same information having been contacted in this way.

5.4.3 Interview with Head of Information Unit

A) Introduction

The Head of the Unit was originally a consultant in Central Information Systems and had come to this post with the specific task at looking at managers' information needs. He had recently set up a videotex system VTX which attempts to combine internal and external information and

make it widely available. This system is described in the following section.

B) The VTX information service

VTX is an experimental service providing daily news and financial data. The Business Affairs department provides internal information such as newsletters and press releases, the Personnel department supplies job vacancies, while the Information Unit itself contributes current headlines and financial indicators. The service thus complements the Compact database which is a retrospective database, as the information in it is always a week out of date. To save duplication of effort, news digests are bought in each morning from Central Information Systems. They have a very large news service, working night shifts to scan the newspapers for the latest industrial news.

The VTX system is available to 1500 people in the company through desk-top terminals, so its coverage is very much wider than the Compact system with 40-50 users. With all database use charged back to departments, the Compact system would need either to increase its user base or incur very heavy charges in order to cover its costs,

The system provides a communications link through to the Compact service, to the British Expertise in Science and Technology database (BEST) and to the company's own Global Report service. This is a Citibank service which

is financially oriented, but also gives world news broken down by industry sector and by company. It is possible to set up individual company profiles on the system. Initially enthusiasm for this service has been high, but the Head of the Unit was not sure that the level would be maintained. For senior managers, PILOT software is used to provide an interactive database of company and business data with facilities for graphic display. Videotex screens in the entrance foyer give news headlines and financial data and have helped to make the service more widely known and used.

The VTX system was very much in its infancy and the amount of information on it was limited. There had initially been difficulties with the linking of internal and external information, some caused by the inflexibility of the information suppliers charging system and others by incompatibility of systems. The Head of the Unit felt one important factor in this development was the fact that the Unit had the right group of people working together, with information systems staff working alongside information scientists. By making databases more widely available that were easy to search and by encouraging browsing, he was aiming to make staff more aware of their potential use. While making information more widely available, he had not lost sight of the need to consider the cost of

providing information and all database use was charged back to departments.

5.5 COMPANY D: CASE STUDY INTERVIEWS 6-7

5.5.1 Introduction

Company D is a small oil company. Interviews were held with the Librarian and the Marketing Manager. A questionnaire had also been returned by the Head of Business Development.

5.5.2 Interview with Librarian

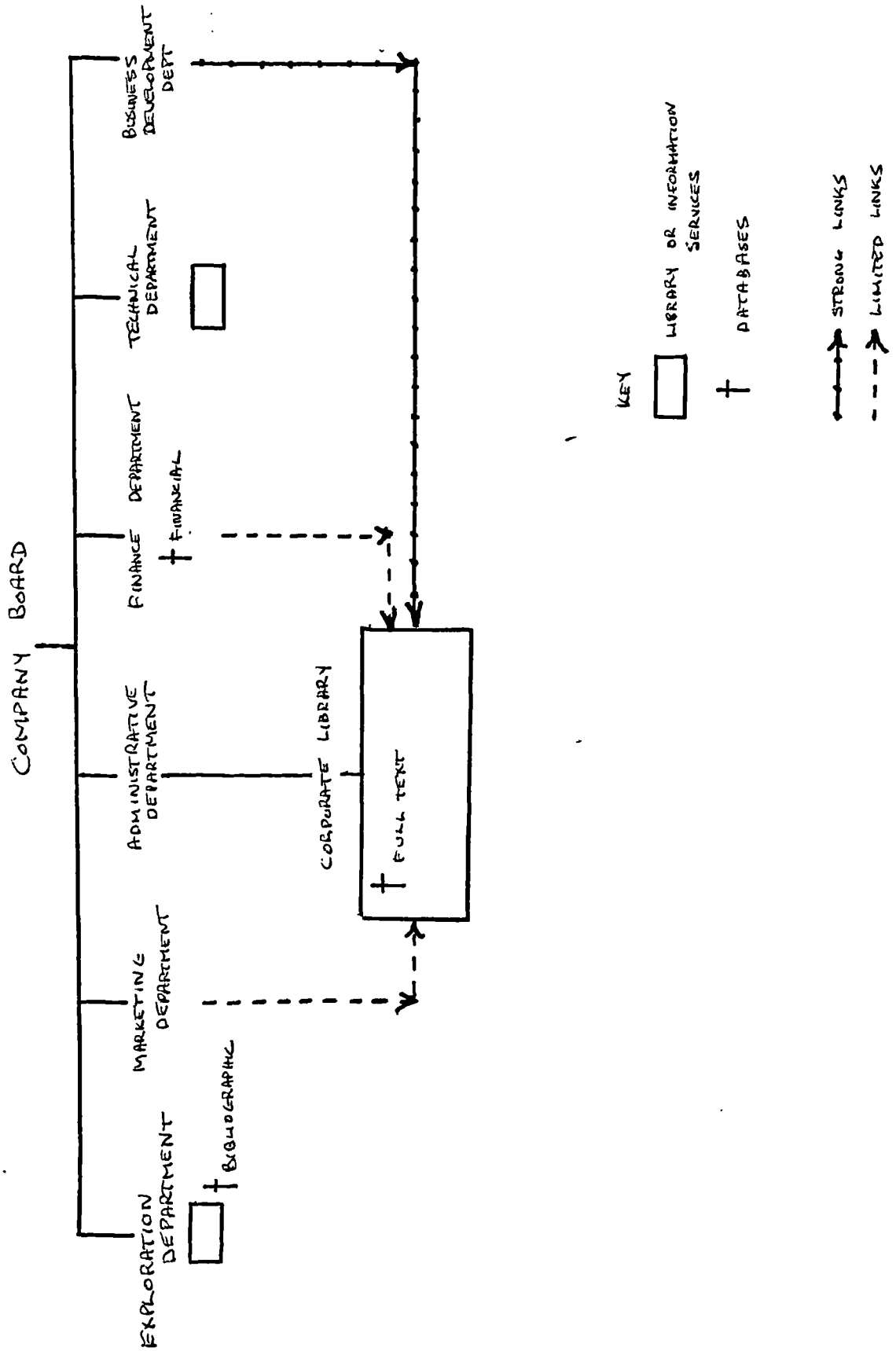
A) Place of the library in the company structure

The corporate library is part of the Administration department, as figure 4 shows. There are also specialised libraries within the Exploration and Technical departments. The Business Development department are by far the heaviest users, with Finance and Marketing (see 5.5.3) making much less use and being more self-sufficient in their information needs.

B) Library services and use

The library has a central role in ordering books and journals for the whole company and is also responsible for providing a central filing and archive service.

Fig. 4


Company D
COMPANY BOARD
EXPLORATION DEPARTMENT
BIBLIOGRAPHIC
MARKETING DEPARTMENT
ADMINISTRATIVE DEPARTMENT
CORPORATE LIBRARY
FULL TEXT
FINANCE DEPARTMENT
FINANCIAL
TECHNICAL DEPARTMENT
BUSINESS DEVELOPMENT DEPT
KEY
LIBRARY OR INFORMATION SERVICES
DATABASES
STRONG LINKS
LIMITED LINKS

There is a small bookstock with general books on the oil industry and material to support central departments. The main use by the Finance and Marketing departments is to consult reference books and back numbers of journals. For the Business Development department, requests are more detailed. For example, the Librarian may be asked to provide all information available on a particular company. The respondent from Business Development rated the library as 'very important' on the questionnaire.

Many questions cannot be answered from the library's own resources and there is a need to go outside, for example to the Department of Energy or the Institute of Petroleum or to the libraries of the larger oil companies. Some types of query are most readily answered by use of the public library. The Librarian has built up informal contacts with other librarians and information officers in the industry. He felt that most requests for information would come through the library, as others in the company would not know where to go for information. This did not prove to be the case, however, in the interview with the Marketing Manager (see 5.5.3).

The Librarian commented that there were a wide range of people in the company, with some appearing to read nothing and others on all the journal circulation lists. Use of the library seemed to depend much more on individual enthusiasm than on the nature of the job.

There are at present no current awareness services and the library catalogue is not yet automated, though a system is expected to be developed shortly.

C) Use of external information services

The only external information service available in the corporate library is the full-text service Textline. This was originally bought for the Business Development department, who remain its main users. People prefer to use it themselves than have a librarian search for them. It was put in the library for ease of access by other departments and the Librarian has organised in-house training courses run by Reuters which have increased use by other departments. The service was, however, not yet known to the company's Marketing Manager, who was also interviewed (see 5.5.3)

There is no central control of use of online services. Dialog and SDC host systems are used in the Exploration library for specialised bibliographic searching. Reuters real-time databases are used in the Marketing and Finance departments and there are two Stock Exchange monitors for real-time share prices in the Company Secretary's office and in the Dining Room.

D) Other sources of information for managers

External contacts are especially important at top level 'where deals are struck'. Such contacts would include government ministers.

At a lower level, the company encourages staff to belong to appropriate professional bodies such as the Geological Society. This gives them access to information and to industry contacts through meetings and conferences.

5.5.3 Interview with Marketing Manager

A) Introduction

The Marketing Manager's job is a specialist one involving trading in crude oil. It is not comparable to the marketing function in its more general sense.

B) Areas of external information of interest

External information is vital to the Marketing Manager's job. She sees the terminal on her desk which provides real-time market prices as a 'lifeline', giving her both financial information and industry news. She operates in an events-driven market and any news stories, whether true or false, could affect prices. Stories of explosions on oil rigs, for example, would need to be verified quickly with people on the spot to decide whether there was a buying or selling situation. Because everyone sees the same news, there is a need to act speedily.

The Marketing department is providing economic assumptions to Business Development, who are involved with corporate deals and working very much on personal contacts. There are many companies changing hands in the North Sea and none of this information is available from public sources.

C) Sources of external information used

As the oil industry has no actual market place for the sale of crude oil, the bulk of the business is done on the telephone. This is backed up by the real-time prices provided by the computer. At the third level are weekly telexes from specialised agencies, weekly journals like Petroleum intelligence weekly or the Middle East economic survey. These journals are always read promptly and have an active use in trading.

Monthly journals like Petroleum economist are read more for background information. They are more likely to be read on the train than at the office desk.

Personal contacts are very important and it is necessary to be known to the industry to make any mark on it. Much of the information relating especially to acquisitions and mergers in the industry is passed only by word of mouth and is not available from published sources.

The Marketing Manager had a good grasp of the sources available to her and a methodical approach to dealing with

problems. She would start with internal sources and if they did not provide the answer she would go direct to the Institute of Petroleum Library and then ring round other libraries.

Areas where she had found information more difficult to obtain were those slightly outside her own specialism. For example, she had recently wanted to find a source for gas prices in India but had not been able to find out anything from her normal sources. Here, as with much of her information need, confidentiality was an important issue and would affect the sources she could use. In many instances, just posing the question would let competitors in the industry know her company's plans.

For answers to more detailed technical questions, the company pays a retainer to two specialised consultancy firms. This is very expensive, but worth it as answers are provided immediately.

D) Use of company library

The Marketing Manager had rated the company library 'fairly important' on the questionnaire return. Her main use was to look up back copies of journals stored there. She felt that her information needs were very specialised and were unlikely to be met from the library's own resources. As she knew exactly where to go for information, it was quicker to ring up the contacts, for

example, at the Institute of Petroleum Library herself, rather than ask the library to do this on her behalf.

It was acknowledged that the Marketing department were not using the library as extensively as were other departments and possibly they were at fault in this.

E) Internal information services

The software state of the art package SALADIN has just been installed. This will allow manipulation of internal and external data and will link to the company's VAX system. The Marketing Manager felt that the oil industry had ben slow to grasp such opportunities.

F) Use of external information services

The Marketing Manager was making intensive use of the real-time information service provided by Telerate, although there were plans to change shortly to Reuters. As described above, there is a heavy dependence on this service for price information and industry news. The Finance department are using Topic, the equivalent financial real-time service.

The Marketing Manager had no knowledge of Textline or bibliographic databases and did not know they were available in the company libraries. Her main interest was in constantly up-dated information rather than the sort of historic data that Textline or bibliographic databases would provide. Had she known about Textline, however, she

could recently have made use of it when gathering material for a tribunal hearing.

The fact that the software package SALADIN had been chosen was due to the fact that she had once shared an office with its designer. Such personal contacts within the industry are very important and there is no interest in general information sources. The main reason for not using a wider range of databases is that "nobody I'm talking to is using them". This means she has no information about them, and sees no point in using them if others in the industry are not also doing so.

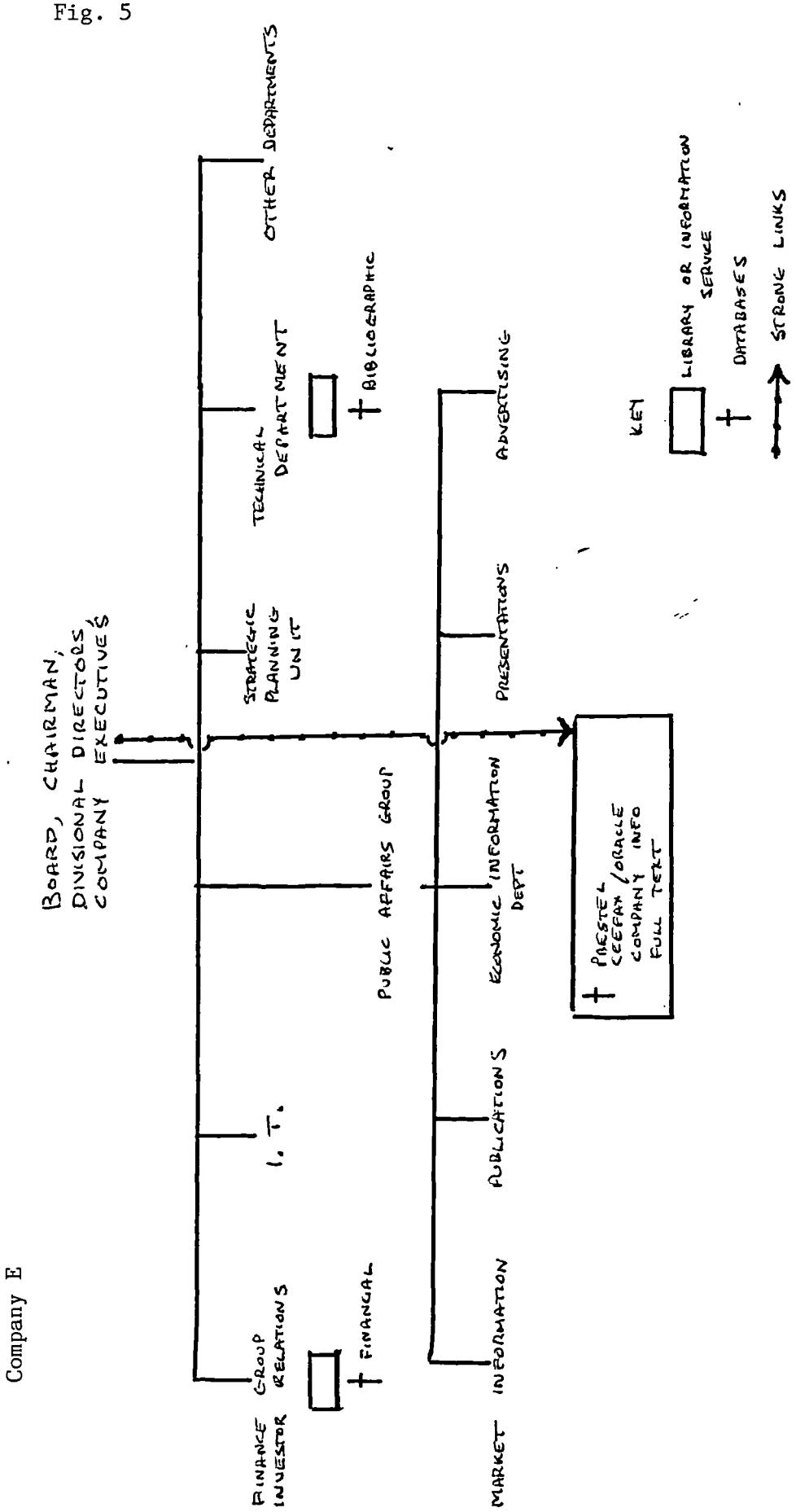
5.6 COMPANY E: CASE STUDY INTERVIEW 8

5.6.1 Introduction

Company E is a large retail company. The interview was with the Manager of the Economic Information Department. A questionnaire was also returned by the IT Executive. The company information structure is shown in figure 5.

Fig. 5

Company E



5.6.2. Interview with Manager, Economic Information department

A) Place of the Economic Information Department in the company structure

The Economic Information department provides a service mainly for the company's board, divisional directors and company executives. Its position within the company is shown in figure 5. It is long-established, having first been set up forty years ago and now has a staff of eleven. In contrast, the company's Strategic Planning Unit is new and small, which explains the emphasis of this department's work on strategic issues for top management.

The department is part of the Public Affairs group, which also includes the Press Office, Publications, Presentations, Market Information and Advertising. Formerly part of the Finance group, this move has affected the direction and emphasis of its work. It has a wider role than that traditionally associated with the information function, in that it is responsible for drafting speeches for Board members and presentations by store managers and prepares the Chairman's statement in the Annual report. This extension of its role occurred because of its placing within the Public Affairs Group and its possession of the type of information on which such material is based.

The Market information section was originally within Economic Information, but was separated when it grew too large. It deals only with marketing issues and its main function is to commission work from outside. It is not as sophisticated in its information provision as the Economic Information Unit, relying more on personal contacts than database searching. There is close liaison with this section, as it is part of the same Public Affairs group.

Some departments, for example Investor Relations, will have their own information sources. There is also a very small Technical Information section on fabrics and homeware which has developed out of one person's personal interest.

B) Economic Information Department, services and use

One of the Department's main purposes is to alert the Board to strategic issues which will affect it. It answers requests from the Board, for example by providing economic and political digests of countries to be visited, and by studies of subjects like the drop in oil prices and its effect on the company. An example of a recent request was to get a copy of the Russian newspaper Izvestiya and details of its circulation within two hours ready for an interview to be given by the company Chairman. Keeping up-to-date was an important factor and the department's added value was its ability to 'jump quickly' and get the information required.

The unit produces regular statistical analyses, comparing the company with national retail figures and with the weekly sales reports produced by a competitor company.

There are plans to produce shortly a 'Business Diary' of economic, political, competitor and supplier information of interest to the company. These were all areas which the department manager considered 'very important' on the questionnaire. This diary will replace the weekly bulletin that used to be produced manually until it became too big to handle. For the new service, the data is being fed into the department's own microcomputer. Distribution will be tailored to divisional directors and executives.

The department manager explained that Government affairs were becoming of increasing importance. There is much legislation now before Parliament which will affect the retail trade, for example Sunday opening, consumer protection, the unified business rate. The Department plays an active role in lobbying Parliament on behalf of the retail industry.

As the service exists primarily for senior members of the company, its enquiry service is mainly confined to this group. Other members of staff are helped, but are generally encouraged to come along to the department and look things up for themselves.

C) Use of external information services

The department has Prestel, but uses it only rarely. On the other hand, Ceefax/Oracle services are in constant use, to check on share values, the value of the pound and travel news. These videotex services are only available in the department.

Databases are used, where they will supply the right information, by department staff because of the cost of allowing end-user searching. The department has access to Profile (FT Business Information) and via this to McCarthy and other services. The database was mainly acquired for its 1992 Spearhead database, but this has not been found helpful because of difficulties with the language used.

Textline is the only service where end-user searching is encouraged, as advance subscription payment allows unrestricted use. The department manager saw this service as an 'invaluable resource' and very easy to use. It fills the gap left by textbooks because it is so up-to-date, especially for information on people. Even Textline is a week behind, however, and the department also subscribes to Press Association tapes, to get advance information before it is published in the newspapers.

Outside the department, financial databases are being used where appropriate, for example Dun & Bradstreet is used in Financial Control for suppliers' credit ratings.

There have been many changes in the past few years as the department has developed from a purely manual system. Though many changes have happened because of developments in Information Technology, the manager pointed out that others have been due to parallel changes in the business itself. It has become more international and its product range has much broadened. At the same time, the Government has become a more important influence. Information needs have had to change to reflect these developments.

D) Other sources of information for managers

The department manager acknowledged that managers had their own personal contacts in other companies. She would not know if individuals were going outside to get information instead of using the Economic Information department, but thought this unlikely to be happening widely as the company was very cost-conscious and discouraged unnecessary spending.

The department uses the FT Business Information service and finds this a good source. The manager also has contacts within other retail companies and all would help one another within the limits of confidentiality. She prefers to work through personal contacts rather than just going to a library for information. Brokers were used for financial press releases, and obtaining annual reports. The House of Commons library was mentioned as a source of information and trade associations would be consulted on

legislative issues. The department is a member of the CBI, the Institute of Directors and the British Institute of Management, but little use is made of their services.

5.7 COMPANY F: CASE STUDY INTERVIEW 9

5.7.1 Introduction

Company F is a large construction company. The interview was held with the Systems Manager, who had described on his questionnaire return how he had tried without much success to interest colleagues in the use of external databases. It was decided to follow up his response in more detail and to look at the approach adopted by a Systems Manager and contrast it with the views of the librarians and information managers in other case study interviews. No other respondent in this company had returned a questionnaire.

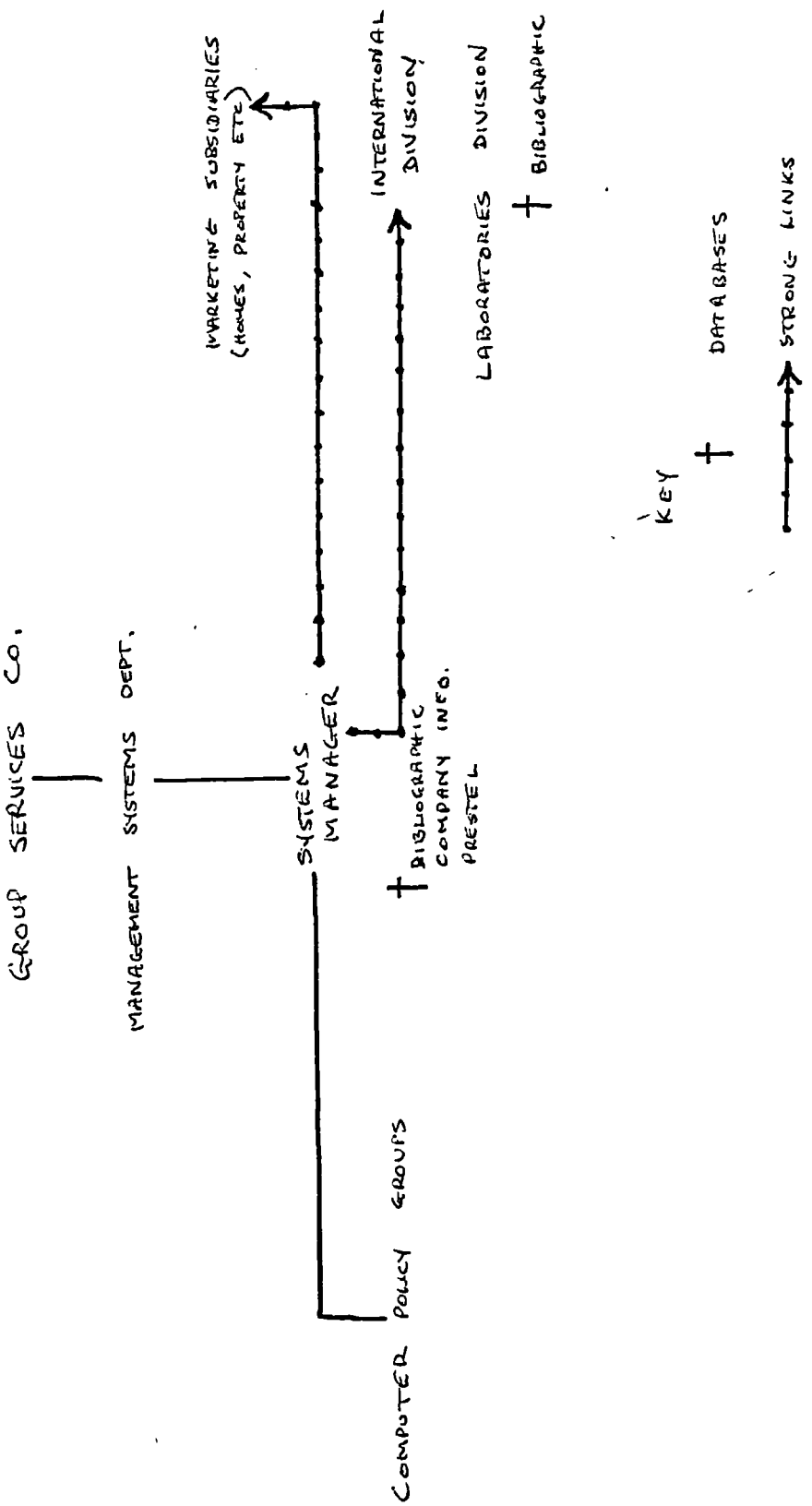
5.7.2 Interview with Systems Manager

A) Introduction

The Systems Manager describes the company as 'very diverse and decentralised'. There is no central library, but separate technical libraries within divisions. The diagram (figure 6) shows the departments with which the Systems Manager has most contact. He works within the Management Systems department of the Group Services company, being responsible for a number of consultancy functions, including organization & methods, computer

Fig. 6

Company F



education and training, and review of technical products and services. Part of the Systems Manager's task is to increase managers' awareness of Information Technology, hence the interest in promoting use of external databases, in particular with the international division and the company's marketing subsidiaries.

B) Areas of external information of interest

The company is much involved with takeovers and mergers. There is therefore interest in gaining information on other companies in this country and overseas. There is also increasing involvement in joint ventures with foreign companies, which has led to a demand for political and economic information on the countries concerned.

The Common Market is another area of interest and one company manager has been made responsible for co-ordinating activities for the single European market.

The company also needs background information on large clients to use when making presentations for example for the building of a new shopping centre or hotel complex.

C) Sources of external information used

External personal contacts are very important. The company chairman is an active member of various committees and through these social and semi-business activities he makes many important contacts with politicians and other

people of influence. The Systems Manager felt that this was the way people found out what was really going on, rather than by "leafing through newspapers".

Local contacts are also important and could provide information much more promptly than any magazine or database. While these could give background information, the company would expect to know about events that were crucial to its business long before they appeared in the press or on databases. For example, if the Egyptians decided to extend use of irrigation water from the Nile and so affect the company's building programme, then local contacts should be keeping the company informed of these developments well in advance of any published source.

D) Use of company library

The company has no central library or information service for managers. Its libraries within divisions provide a technical information service.

E) Internal information services

The Systems Manager's own job within the Systems department has changed since the actual production of systems was decentralised to smaller computer departments within subsidiary companies. He works with a Computer Policy Group which has the job of promoting use of IT within the company. It also has the right staff to explore any new development that looks of potential value.

F) Use of external information services

In response to the information needs outlined above, the Systems Manager had tried to interest managers in using external databases. He had recently persuaded the company secretary to issue a management circular encouraging greater use.

He and his staff had for some time been arranging demonstrations of various services, but he was very disappointed when he followed these demonstrations up to find that there had been hardly any use at all. For example, about eighteen months ago, he had contact with the commercial manager of a group of subsidiary companies who was collecting information on American companies operating in the industry. He introduced him to Dialog and he obtained a print-out of the information he required. He had hoped to be able to quote this manager as a successful user, as he has since taken over a number of US companies, but in fact for none of the companies he has taken over was any information available on the databases. What he gained therefore was much useful background information on the state of the industry in the US and on larger companies within it, but no specific information on the actual takeover targets, as at the time nothing had been written about them in the press accounts on which the databases are based. The systems manager felt that this example demonstrated that the value of

external databases lay in providing fairly quick access to background material for an introductory briefing on a subject as a substitute for a 'clippings agency' function.

In another similar example, he had had a confidential request to investigate a Japanese company with a view to take-over. He checked every database but found no mention of the company, although he knew it was a well known name in Japan. In this example, he saw an illustration of the power of large companies, in Japan at least, to influence the press in what they write and what they suppress.

For marketing activities in this country, the Systems Manager is currently demonstrating the McCarthy files on Profile to directors of marketing subsidiaries. These companies need to be competitive in bidding for building contracts worth £3 million or more from major stores and hotel groups. He sees a use here in getting background information on the client company so that when the members of the marketing team make their presentation they will have all the public information on the company to hand and will demonstrate that have prepared their case thoroughly. This sort of information has never been collated by the company before and this would therefore be an innovative step. From his previous experience, he has learnt not to expect too much, however, and does not expect that external databases will be of any use for the more detailed work once the project has been accepted.

He sees another use for databases in the International Division, with its business development and marketing activities. Clipping agencies have been used in the past to provide general background and political comment and databases could well take their place.

As in company E, Spearhead, the 1992 database, is being used as part of the Profile service. The manager expects this to provide a convenient way of keeping up-to-date, especially as an assistant manager in the department is interested in experimenting with the technology.

The company's technical library in the Laboratories division is the main user of Dialog within the company. Cost is a problem for inexperienced searchers using Dialog and for that reason Profile is better liked outside these specialised technical areas because it is easy to use.

His own experience has been that interest in using databases is high at first but soon dies down. When Prestel was introduced everyone appeared very interested and keen, but there was little take-up and use. In spite of the setbacks, the Systems Manager still sees a role for external databases in providing background information and keeping people informed.

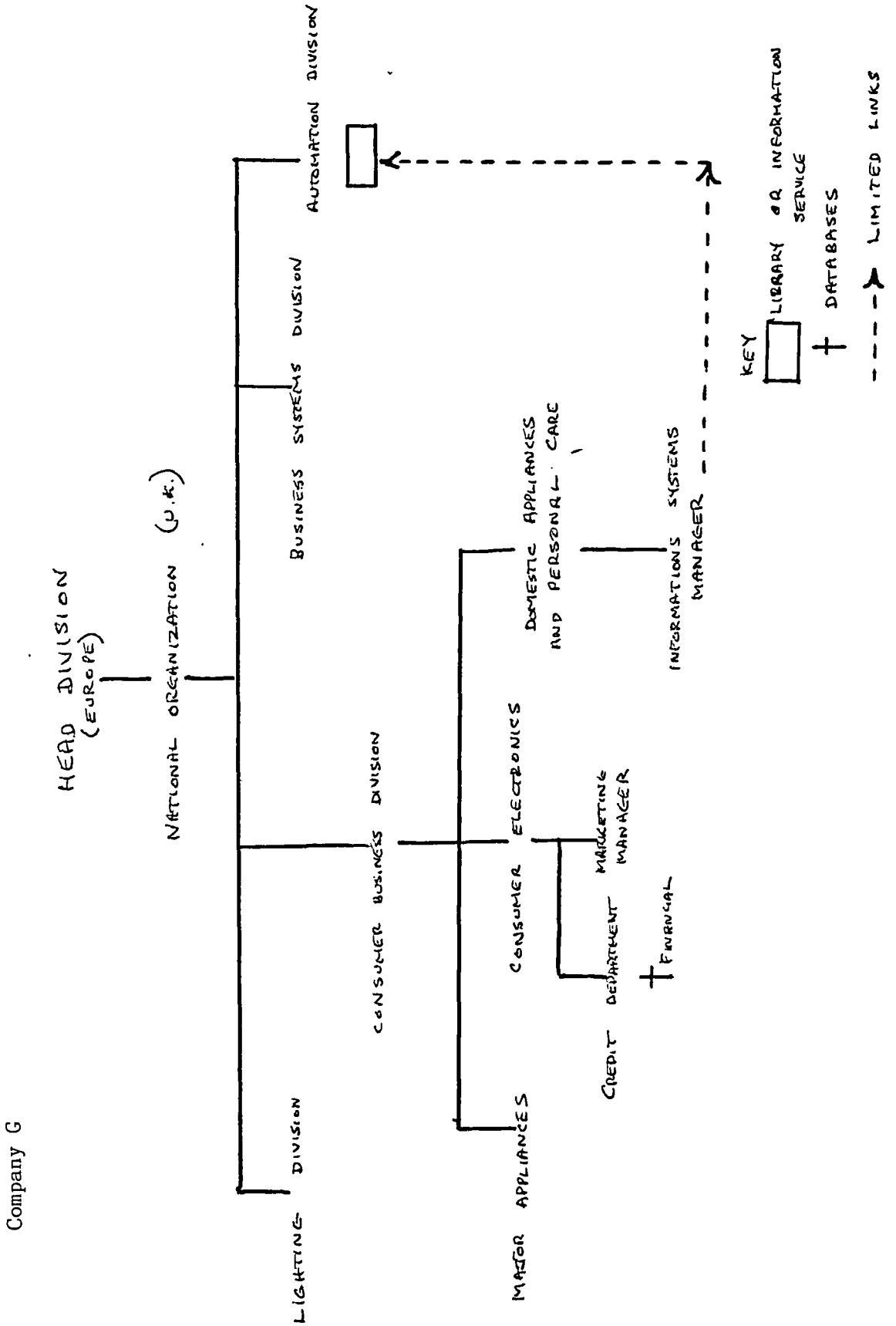
5.8 COMPANY G: CASE STUDY INTERVIEWS 10-11

5.8.1 Introduction

Company G is a large electronics company with a head office in Europe. In each country in which the company operates there are national organizations each with separate divisions. Survey questionnaires had been sent to managers within individual divisions at the suggestion of the company's head office. Interviews were held with the Information Systems Manager in the Domestic Appliance & Personal Care Division and the Marketing and Sales Operations Manager in Consumer Electronics, both within the Consumer Business division and based at the same location. Replies had also been received from the Strategic Marketing Manager in the Business Systems Division, the Divisional Director in Lighting and the Director of Information Services in the Automation Division. The diagram (figure 7) outlines the various company divisions and the positions of the two managers interviewed. The company has no central information service and the Information Systems Manager does not have the same responsibility for promoting use of external information services as the Systems Manager in company F. This company therefore illustrates a different approach to external information use from other case study companies.

Fig. 7

Company G



The Marketing and Sales Operations Manager described the business as a "strictly commercial operation" and not typical of the electronics industry as a whole as the development work was done from the European head office.

5.8.2. Interview with Information Systems Manager

A) Introduction

The Information Systems Manager forms part of the executive team in the Domestic Appliances & Personal Care Division, with the Managing Director and Finance Director.

The company has a central group of automation specialists in its Automation division, but most of its former members have now been dispersed within product divisions. Its main role is now to give advice and help. This arrangement has overcome the danger of having a group of people working together "dreaming up solutions to problems that don't exist".

Each country is able to produce its own automation strategy, as long as interfaces between systems are possible. This gives the company greater flexibility and freedom in the design of its systems.

B) Areas of external information of interest

This respondent had marked only Competition as 'very important' on the questionnaire and he emphasised in the interview that market intelligence was the single most important area for the company. His personal need for

external information was small and he was not sure what external information might be available to him that he could find useful.

C) Sources of external information used

With little need for external information in his job, the Information Systems Manager had marked no source as 'very important' on the questionnaire. He considered that for the company the main sources were the market intelligence provided by such companies as AGB and the German company GFK combined with that from the Society of Electrical Appliance Manufacturers where company data could be compared with total market share.

The manager had therefore given an 'important' rating to professional/trade associations, and also to internal reports and external personal contacts. He saw external contacts as a source of finding out information that was not publicly available, such as a rival company's market share. Although getting this information usually involved some 'cloak and dagger' work it was also done by other companies in the industry.

The company's sales force are also providing market information. With the company's reputation and its number of large customers there is no need for the 'hard sell' and much of the salesmen's time is spent on market intelligence gathering, comparing prices, looking out for new products from competitors etc. It is intended that

the salesmen use their Epson machines not only to key in orders but also to relay market intelligence information back to the office.

D) Use of company library

Whereas the Marketing and Sales Operations Manager had indicated on his questionnaire return that he did not have access to a library, the Information Systems Manager, who was based in the same building, indicated that there was a library. He explained in the interview that he was referring to a specialist automation library in another location. This was the only company library of which he was aware, but he thought there might be some sort of information service in the central London head office, probably to support the Finance department. He regarded his use of this automation library as 'fairly important'.

E) Internal information services

The company is the biggest user in the country of private viewdata, with its own service covering 850-1000 dealers and used for the ordering of spare parts. Although the company advertises on Prestel, no other use is made of it.

The company has a Management Information database called 'Genie ' which is widely used. It is based on internal information relating to orders, customers and sales history and is updated once a month. Real time data

can be accessed at the same time. For top executives, an 'Executive Genie' system has been developed, which is menu-driven with enquiry functions built in.

As yet the company has no market intelligence database and this type of information was still collated from documents. The Information Systems Manager recognised that this was an area that needed addressing. It was important to get information fast. If a competitor produced a new product, the company needed to know immediately and not in six weeks time when the routine report came out.

Office automation is used very extensively. The company's own system is widely used for electronic mail, diaries etc for contacts anywhere in the world and is considered by many to be one of the most advanced available. The company's efforts have thus been concentrated on internal information which relates directly to the business. The Information Systems Manager explained that the company "attacked priorities first where it was easier to see the benefits". Thus while Dun & Bradstreet's credit information is seen as vital, other external information services have not been given a high priority.

F) Use of external information services

The Information Systems Manager admitted that though he had heard of external information services, he had not really studied the market as he had no real need to use them. He knew that they were used in the company's finance departments, for example the use of Dun & Bradstreet for credit checking. His own interests were much more in the development of the company's own internal databases.

5.8.3 Interview with Marketing and Sales Operations Manager

A) Introduction

The Marketing and Sales Operations Manager in the Consumer Electronics section of the Consumer Business division comes from a corporate planning and market research background, but his present job is more involved with customer service and providing the necessary back-up support to the sales force. He had at one time been involved with the Information Systems Manager in database development and was able to give a different perspective on information use from that of his colleague whose work involved mainly internal information.

B) Areas of external information of interest

The marketing manager estimated that 90% of the information required for decision-making in marketing and sales was external. Decisions on pricing, budget, sales promotions and suppliers are governed by the view of the market and the competition and most of this type of information is unstructured. In the questionnaire he saw Cost/price structure and Competition as 'very important'.

C) Sources of external information used

This manager had marked Company personnel and External personal contacts as 'very important' on the questionnaire. He gets a substantial amount of his information from the salesmen. However, he pointed out that this information was generally relayed by word-of-mouth, indicating that the Epson system described by the Information Systems Manager is not being used as widely as he had imagined. If a salesman notices that a rival company is running a special promotion on its videorecorders, for example, he would expect that salesman to report this back to him. If he wanted specific information he would ask the salesmen to get it for him. For example, they would know which dealers they could ask to supply them with a competitor's trade prices. Such information would never be available on databases or other than by word-of-mouth.

The division is buying in information from the audit firms AGB and its German equivalent GFK. These services collect data from retailers and from sampling methods and present it in such a way that it is possible for an individual company to compare its own market share through retail outlets with that of its competitors. At present this information is in printed form. The company has experimented with computer tapes but found the system so unstructured that it was not worth the effort. They have now decided to wait until AGB or GFK themselves develop computer systems, as they feel it would be a waste of time to develop their own.

The information services from AGB and GFK are complemented by the statistical information provided by BREMA (British Radio Electronics Manufacturers Association). This operates a pooling system and takes in aggregate information from major manufacturers, providing information very quickly in detail product by product. The division is spending a great deal of money on market research surveys, in the region of £1 million a year. This includes both commissioned surveys and purchase of omnibus surveys.

The Marketing and Sales Operations Manager reads the Financial Times and the weekly trade journals and reckons that these with the personal contacts provide him with all the information he needs. He maintains his own collection

of customer files made up from photocopies of articles he sees in the press. He goes through the files every six months or so to weed out-dated material. He has considered putting this information on database, but finds the file system more convenient as he can in this way keep all material relating to a company together.

Most enquiries he receives are ad hoc and he is generally able to answer them from his own resources, starting with his own customer files and going on to ICC reports on microfiche and stockbrokers reports. He knows the type of questions he is likely to be asked and the customer files he keeps ensure he has adequate reference facilities. Beyond this stage, it is difficult to sustain the effort of collecting information. He had used the FT Business Information Service once to provide information on competitors, but found little interest in the information provided. If he was not getting requests for information he saw no need to go to the expense of getting it.

D) Use of company library

There is no central library for managers in this company and the marketing manager was not making any use of library facilities.

E) Internal information services

The manager has access to the company's internal database 'Genie' which was described by the Information Systems Manager (p143). This provides him with a mass of internal data, but he commented that managers in sales and marketing were really only using this to 'fiddle' their targets and not as a means of understanding what was going on within the company.

F) Use of external information services

A few years ago, this manager had been given the job of investigating commercial databases as a source of information on customers. He chose the one that cost the least - at the time Datasolve (now Profile). In the first year, it was used for only 3-4 enquiries on companies that they did not normally deal with, for example a Japanese supplier. In the second year, it was not used at all, so he cancelled the subscription. As there are very few new people coming in to the industry he knows all the competitors, so the trade press is providing all the information. He thought databases were too general. He was looking for specific information on his own industry and only in the very unlikely event of someone new entering the industry would he not be able to pick up information from his usual sources.

He felt his lack of use was "not for want of trying these things". He knew that the Credit department had the

Dun & Bradstreet database, which he would use if the need arose.

He repeated the view of the Information Systems Manager interviewed that demand in the company was much more for operational equipment and that computer investment on information was regarded with suspicion. Anything "just nice to have" has to come far down in the queue.

Far from subscribing to the view that information should be free, this manager was actually suspicious of anything that was published and freely available and thought it could not be of much value. "To get really valuable information," he said, "you have to be prepared to pay for a market research survey."

This manager saw a limited use for external databases where a company was looking for a completely new product, but felt that after this preliminary investigative stage it would be necessary to seek more detailed information from a market research agency. He recognised that his own company could have used this approach when it decided to enter the personal computer market.

5.9 SUMMARY

In five of the seven companies visited (Companies A-E), managers had access to a central library/information service. These ranged from the traditional library to the

fully developed information service. Differences and similarities between the services provided are given in summary form below.

5.9.1 Place of the library in the company structure

In Companies A and D, libraries were part of central administrative departments. Company B was within an R & D department, Company C within Information Systems and Company E within Public Affairs. All librarians interviewed saw their placing within the company structure as important both for the type of service provided and for the level of funding and support received. Only in Company C was responsibility for external and internal information combined in one department.

Company B provided an example of a traditional R & D library service which found itself increasingly being used by marketing and other management staff because of its access to online databases and other information services.

Corporate plannning staff were important users of library/information services in Companies A, C and D and had often worked with the library on the development of systems. In Company E, the information service was specifically set up to provide strategic information for top management. Marketing and finance departments in the case studies were generally less heavy users of the

library and saw it more as a place to consult books and journals than as a source of external information.

5.9.2 Library services and use

Companies A, B and D were responsible for central purchasing of books and journals which gave them a largely administrative role. Company B was also responsible for maintaining the company's product files and Company D for filing and archives.

Examples of a more pro-active approach to information were found in the range of services provided in Company C and by the responsibility in Company E for alerting top managers to new developments. The Economic Information Unit in Company E also had a range of other duties arising from its position in Public Affairs which gave it a high profile within the company. This company was also actively planning its own database of external information. A number of database services for both external and internal information were already well established in Company C.

5.9.3 Use of external information services

Differences between the libraries visited in the larger pharmaceutical and oil companies (A and C) and the smaller (B and D) were particularly apparent in relation to the number of database services available. Companies A and C were using a very wide range of electronic information services, whereas Company B was at present

using only bibliographic and specialised databases and Company D only Textline. In both Companies A and C, there was central control of susbcriptions to electronic services, to take advantage of maximum discounts.

Textline was the most widely used service, available within the libraries of Companies A, C, D and E. It was the service most liked by end-users. Bibliographic databases were used extensively in Companies A, B and C. Company E provided the only example of use of videotex services.

Financial databases were not generally found in the libraries visited, although they were widely available within company finance departments.

In the remaining two companies F and G, libraries were providing specialised technical services and managers were responsible for collecting their own external information, either on their own (Company G) or with support from an Information Systems Manager responsible for both internal and external information services (Company F).

5.9.4 Approaches to external information

From the case studies, four different approaches to external information use can be identified:

1. Individual approach

   Company G (figure 7)

2. Library approach

   Companies A, B and D (figures 1, 2 and 4)

3. Systems approach

   Company F (figure 6)

4. Information management approach

   Companies C and E (figures 3 and 5)

It should be noted that even where other approaches are available, managers themselves will often prefer the individual approach. Both marketing managers interviewed (Companies B and D) were making little use of their company libraries, and had their own methods of collecting external information. There is further discussion of these four approaches as models of external information use in 9.6.

CHAPTER 6 ANALYSIS AND DISCUSSION OF SURVEY AND CASE STUDY INTERVIEWS I: AREAS AND SOURCES OF EXTERNAL INFORMATION

6.1 INTRODUCTION

In this chapter, the general findings of the survey and the case study interviews relating to areas and sources of external information are discussed in relation to the work of other researchers. This discussion is continued in the following chapter with an analysis of use of internal and external information services. Chapter 8 presents a more detailed analysis using the three variables of industry type, company size and functional group.

6.2 AREAS OF EXTERNAL INFORMATION

6.2.1 Introduction

The fourteen areas of external information listed on the questionnaire are considered here in the four broad sectors to which they belong:

Market Sector : Competition: Market trends : Consumer attitudes : Customers and suppliers - actual and potential: Introduction/deletion of products or services: Cost/price structure

Technology Sector: Technological developments: Technical information

Acquisitions and Mergers Sector

Environment Sector: Demographic trends: Current affairs: Legislation: Economic conditions: Government policies

These sectors are largely based on those identified by Aguilar (1967). Having interviewed managers on the areas of information of interest to them, he identified sixteen separate categories of external information which he then grouped into five major areas: Market: Technical: Broad issues: Acquisition leads: Other.

Keegan's study (1967) uses very similar categories: General conditions; Marketing: Resource information: Prescriptive information: Other. Kefalas and Schoderbek (1973) use ; Technology: Market: External growth: Government : Other.

Mintzberg's chief executive was seeking and receiving information on all these sectors:

> The chief executive seeks and receives information concerning clients, personal contacts, competitors, associates, and suppliers, as well as information on market changes, political moves, and developments in technology. (Mintzberg, 1967: 68)

Both the survey results and the case studies point to a general awareness of the importance of external information, particularly as it relates to the marketing area. In the case study interviews, the three marketing

managers in particular saw external information as vital to the success of their work.

6.2.2 Market sector

6.2.2.1 Competition and Market trends

In this thesis, the Market sector received the highest overall ratings, with Competition and Market Trends the most important areas. In small companies, Competition was the only one of the fourteen areas to be rated above 3 ('important'), with Market trends just slightly below. The consistently high ratings accorded to Competition and Market trends in this survey across all industries and all sizes of company show a similar regard for the broad market areas as was noted in earlier research.

Aguilar's research found that 58% of responses from managers interviewed related to 'Market Tidings', three times the number (18%) for the next highest category 'Technical Tidings'. He found this particularly surprising as only 27% of respondents were themselves in the marketing area and most managers were from technological industries (Aguilar, 1967: 42-3). The proportion of respondents in this survey who were marketing managers (22%) was similar to that in Aguilar's survey, yet 56% and 48% of total respondents gave Competition and Market trends a 'very important' rating.

Keegan too found marketing the most important area with 37% of responses. In particular, 85% of information obtained by marketing managers was from the marketing area, with an interest in either competition or general marketing conditions (1967:66). As with this research, Keegan noted that interest was directed more to 'Competitive marketing activities' than to 'Consumer/ customer' behaviour (1967:77). While Kefalas and Schoderbek, using a different research methodology, found that the marketing sector did not have such a large lead over other areas, it still accounted for 33% of time spent on external information (1973:69). More recently, White and Wilson have reported that 'external information on competitor activity was cited regularly as being the most important and the most difficult to obtain' (1988:18).

The evidence of the questionnaire survey is backed by the results of the case study interviews. In the electronics company (Company G), for example, the marketing manager saw his main requirement as external information on the market and competition and his main source the market intelligence data which enabled the company to compare its own market share with general trends in the industry and with the activities of competitors (p146-7).

In the retail company (Company E), the Economic Information department was producing regular statistical

analyses comparing the company with national retail figures and with figures produced by a competitor (p129). In the large oil company (Company C), the Information unit was scanning newspapers and journals for competitor information to put on its in-house database (p112). Other information services similarly reported that information on competitor companies was frequently sought.

6.2.2.2 Customers and suppliers - actual and potential

Knowledge of the plans and activities of both actual and potential customers is as important to managers as information on competitors: 'a company's survival is dependent upon its relationship with its customers' (White & Wilson, 1988:16)

In this survey, Customers and suppliers received the next highest rating after Competition and Market trends within the Market sector and while not rated as highly as these overall, they were particularly highly regarded in the electronics and construction industries, where they were rated at 3 or above ('important') on the four-point scale. Among respondents, there were significantly higher ratings from systems, finance and marketing staff and this was one of the few areas where librarian/information officers registered lower ratings than other functional groups. Unlike the other respondents, librarians would have no direct contact with customers, so are perhaps failing to appreciate their importance as an information

source. Case study interviews in both the construction and electronics industries (Companies F and G) spoke of the need for collecting information on the company's actual and potential customers (p134, 148).

6.2.2.3 Consumer attitudes

Consumer attitudes showed a marked difference between industries, taking second place after Competition in mean ratings for the retail industry with a rating of 3.33 (p=.0006). This was in sharp contrast to the construction group where it had the lowest mean rating (1.89) of any area. It also had a high profile with marketing managers, who placed it in third position after Competition and Market trends. There were no examples in the case studies of Consumer attitudes being explored, except as part of general market research studies.

6.2.2.4 Cost/price structure and Introduction/deletion of products/services

Cost/price structure and Introduction/deletion of products/services received much lower overall scores. with noticeable differences between industries. Of these two areas, Cost/price structure had the higher ratings in the oil and retail industries and Introduction/deletion of products/services in pharmaceutical companies. These different ratings for industries reflect priorities within the industries themselves.

Reasons for the different industry priorities will be found in the case studies. In the smaller oil company (Company D), real-time market prices provided the essential information for decisions on buying or selling crude oil (p121). In the smaller pharmaceutical company (Company B) the introduction of new products through R & D research was a very important part of the company's activities (p106). The importance of various areas of information in relation to industry types is further discussed in 8.2.

6.2.3 Technology sector

6.2.3.1 Technological developments

In both Aguilar and Kefalas and Schoderbek, the technological area takes second place to the market sector. Kefalas and Schoderbek found that these two sectors together occupied 58.3% of total time spent by managers on external information. (1973:70).

In this survey, Technological developments took third place overall behind Competition and Market Trends and was the only other area to be rated above 3 on the four point scale, with 38% of respondents regarding it as 'very important'. Ratings in the electronics and pharmaceutical industries were significantly higher ($p=.0058$) with Technological developments predictably coming first in the mean ratings in electronics, as a further indication of the importance of the industry variable in areas of

external information. Among functional groups, the highest ratings came from librarians, management services personnel and systems managers, in the latter case particularly reflecting their principal area of interest.

6.2.3.2 Technical information

In studies of smaller firms, technical information was seen as of great importance to the small manufacturing firm (Capital Planning Information, 1982) and product information was second to marketing information in Roberts and Clarke (1988). In the Suffolk study, technical information was also the most important area (Trott & Martyn, 1986). In Blagden's survey of British Institute of Management members, for library users technical information came second to 'management principles' but among non-library users it was first in importance (1980a). In the CURDS study technical information achieved the highest level of success in the case study approach (University of Newcastle-upon-Tyne, 1983).

Technical information was rated tenth overall in this survey and received a lower rating than the wider area of Technological developments. It had a significantly higher rating (p=.0301) in the pharmaceutical industry where it was rated above 3 and especially among librarian respondents who put it in third place after Competition and Technological developments (p=.0072). This reflects both the particular needs of the industry and the

established role of its librarians in providing technical information for Research & Development departments. The librarian in the smaller pharmaceutical company (Company B), for example, saw his main role as the provision of technical information in support of R & D. (p99). In other companies visited, there were examples of small technical libraries supporting work in construction (p132) or electronics (p143).

It would appear, therefore, that outside the technical libraries themselves, technical information does not have the importance in the larger firms taking part in this survey that it had in other research surveys which looked at smaller companies. It is significant in this respect that the more traditional technical libraries in the oil and pharmaceutical industry case studies (Companies B and D) were both in the smaller companies and that when measured by company size there was a significantly higher ranking (3.03) from the medium group of companies rather than the large. This is no doubt because the larger firm is taking a broader view of its external environment, whereas the information needs of smaller firms are more immediate and more concerned with day-to-day issues.

6.2.4 Acquisitions and Mergers sector

In Aguilar's survey (1967), this item was placed in a separate category as it was not expected to behave like any other area. It is considered as a separate item in this study also and, like Consumer Attitudes, there was a divergence of opinion, with 40% of respondents regarding the area as 'very important' and 17% as 'not important'.

Aguilar found that the largest companies were the most involved with Acquisition Leads. In the pilot survey, this finding was supported, but in the main survey differences were more marked by functional group and by industry. Kefalas and Schoderbek found managers in Corporate planning and Finance to be most concerned with both Government (see 6.2.5.2) amd the External growth category which included Acquisitions and Mergers (1973: 70). Similarly here, this area received significantly higher ratings (p=.0311) from librarians, corporate planners and finance managers, coming in second place after Customers & suppliers for the finance group. The area was rated above 3 ('important') by respondents from the oil and construction industries, with the latter placing it first in its mean ranking.

The research also noted a correlation with the use of external information services, as mean rankings increased according to the number of services in use, with the area rated at 3.10 and third in importance in the Extensive

users group. This relationship between interest in Acquisitions & mergers and external database searching was supported by the case studies. Examples of the use of databases for searching for information on potential acquisition candidates were given by the librarian in Company A (p96), the marketing manager in Company B (p107) and the systems manager in Company F (p136-7). The sensitive nature of information searches in this area was given as a reason for corporate planning departments preferring to conduct their own searches in Company A (p96), and the difficulty of locating detailed information on specific companies in databases was mentioned by the systems manager in Company F (p136-7). These examples attest to the importance of acquisitions and mergers in many companies and to the difficulty in getting detailed information in this sensitive area.

6.2.5 Environment sector

6.2.5.1 Introduction

Aguilar has drawn attention to the importance of looking beyond the immediate industrial environment towards the wider environment in which the company operates:

> Scanning must move farther and farther from the immediate environment of the company in search of basic trends. Emphasis must shift from the immediate areas in which the company competes to the industry as a whole, and thence to the aggregative and general economic, technological, political and social spheres. (Aguilar, 1967:9)

Aguilar in his interviews with managers noted a lack of emphasis on 'Broad Issues' (1967:44) which he found discouraging for the future of long-range planning, particularly as 39% of his respondents were top managers and although there were significant differences by company size, the overall number of responses was still small. Kefalas and Schoderbek found more attention given to the 'relatively controllable' Market and Technology sectors than to the 'relatively uncontrollable' sectors of External growth and Government (1973:70). Keegan's study found no social or cultural factors considered (1967:77).

Bhatty (1981) in a study of corporate planning in UK medium sized companies found that 92% of companies were considering economic trends, but only 77% were analysing political and social trends. Bhatty too found that 'there was greater emphasis on product/market factors 'the harder and more tangible' aspects of corporate planning than on the 'softer and less tangible' elements to be found in the company's external and internal environments' (1981:65).

Alongside this evidence of lack of attention to the broader external environment, researchers are pointing to its growing importance. The Technical Change Centre (1983) sees new technology and the wider market leading to a greater demand for information on the environment. Research studies by Kelley (1968), Pfeffer and Salancik

(1978) and Reinhardt (1984) have all pointed to the importance of this environmental information for industry.

As with previous research studies, this survey has also shown that the greatest importance is attached to external information in the Market and Technology sectors. While less emphasis is put on the Environment sector, there are indications from the survey results and the case studies that more attention is now being paid to the Political and Economic environments than some earlier studies would suggest, but that the Social environment remains of a lower priority. These three aspects of the organization's environment are considered below.

6.2.5.2 Political environment: Legislation and Government policies

Fahey and King (1977) in their study of environmental scanning activities considered that the regulatory area was the most crucial sector of the environment. This is reflected also in the results of this survey, where Legislation was in fourth place, after Competition, Market trends and Technological developments. It was regarded as 'very important' by 32% of respondents and as 'not important' by only 6%.

In the pharmaceutical industry, Legislation came second in the mean ranking and had a significantly higher score than in other industries (3.39)(p=.0306). Government policies followed a similar pattern. The influence of

government over the pharmaceutical industry was emphasised by the marketing manager in Company B.

The increasing importance of government was noted in other industries also. The Economic Information Manager in the retail company (Company E) pointed to the amount of legislation currently before parliament affecting the retail trade (p129). Both the retail and construction case study respondents (Companies E and F) mentioned 1992 and the single European market as areas where political information would be of vital importance (p130, 138).

Among functional groups, Legislation received ratings of 3 or more ('important') from corporate planning staff, librarians, finance and management services personnel. Results for Government policies were similar. Such respondents are likely to have more direct concern for the political sector and its impact on their companies.

Legislation and Government policies were less highly regarded by systems and marketing managers, possibly because they did not see these areas as their responsibility. This was the case with the marketing managers in the smaller pharmaceutical company (Company B) and the electronics company (Company G) who saw their jobs in terms of very clearly defined external information requirements, with the collection of broader political and economic data resting either with Head Office or with local operating units (p107, 149). The need for general

background and political comment on the countries in which the company was doing business was acknowledged by the systems manager in Company F, who also had no central library support and had been trying himself to persuade colleagues to use external databases for this purpose (p138). Jain suggests that neglect of the company's environment is due not to a failure to recognise its importance, but to an inability to "make a systematic effort at it" (1984: 119). In the examples quoted above, there was no central information structure which would ensure that such information was collected. In contrast, in the large retail company (Company E), the preparation of economic and political digests on countries of interest to the company was seen as one of the responsibilities of the Economic Information Department (p128).

6.2.5.3 Economic environment: Economic conditions

Much that has been said above about the Political environment applies equally to the Economic environment, represented in this survey by Economic conditions. This area was in seventh position overall and was rated above 3 only by the construction industry, where it was in third place after Competition and Market trends. This demonstrates, as Shoolbred has pointed out (1987: 123), the vulnerability of this industry to economic changes.

The importance of the Economic environment to the large retail company (Company E) is attested by the naming

and primary function of its Economic Information Department. General economic conditions were also being monitored in the two oil companies (Companies C-D).

6.2.5.4 Social environment: Demographic trends and Current affairs

This research follows the trend noted in earlier research studies by demonstrating the lack of importance given to the organization's social environment. 26% and 19% of respondents respectively in this survey rated the two areas of the Social environment as 'not important', while only 13% and 7% considered them 'very important'.

The highest rating for Demographic trends was from the retail industry (2.71) (p=.0244), but it received a lower rating than Consumer attitudes in the Market sector, though both factors must be of relevance to future developments in the retail trade.

Current affairs was the only information area to show noticeable differences by industry, company size, functional group and extent of use of external information services. It received the highest rating from the oil (2.46) and pharmaceutical industries (2.61) and the lowest rating from electronics (1.83)(p=.0065). Librarians gave it a rating of 3, putting it in eighth place, significantly higher (p=.0128) than any other functional

group. 40% of librarians rated it 'very important' but very few respondents from other groups.

Associated with this higher rating from librarians is the fact that the importance attached to Current affairs increases noticeably in line with increased use of external information services. It is rated 1.94 by non-users and 2.53 by extensive users. Similarly, there is increase in importance in relation to company size.

Whereas librarians are aware of the importance of Current affairs to the company, other functional groups clearly do not regard this as an important area. Smaller companies which do not have extensive access to external information services consider this area particularly unimportant. This is somewhat surprising in view of the high value placed on Newspapers and periodicals as information sources (see 6.3.7).

From the evidence of the case study interviews, managers would argue that their information needs were industry-specific and they were not interested in general current affairs type information. This is often their reason for failing to use online databases, which they consider are really only suitable for general background information. This point is considered later in relation to database use (9.4.5). The library's role in actively scanning for information gives it a higher regard for this type of current affairs material, which is often most

conveniently available in database form. Hence the higher importance attached to Current affairs by users of external information services.

6.2.6 Summary

This research agrees with earlier findings on the areas of external information of importance to managers:

1. Competition and market trends are considered the most important areas in all industries and for all types of manager. Technological developments come next in importance.

2. Broader issues relating to the political, economic and social environment are generally seen as less important. This is most marked in the case of the social environment.

3. Within this framework, the order of importance reflects the particular concerns of the industry (eg the importance of Consumer Attitudes in the retail industry) or the management function (eg the importance of Acquisitions and mergers to finance managers).

By considering views from both librarians and managers and by looking at users of electronic external information services, the study presents the following new findings:

1. Low and non-users of electronic external information services generally attach less importance to all areas of information. In particular, Current affairs information is

more highly rated by librarians and by extensive users of these services.

2. Librarians place a greater value on all areas of external information, with the exception of Customers and suppliers, which are more highly regarded by managers.

3. Technical information is highly valued by librarians, but its rating by managers in this study is much lower than that noted in studies of small companies.

4. Within some larger companies, information units have specific responsibility for the collection and dissemination of political and economic information. Individual managers do not see the collection of this general information as their responsibility.

6.3 SOURCES OF EXTERNAL INFORMATION

6.3.1. Introduction

Mintzberg's study gives a concise account of the various sources of information which the manager might use:

> His personal contacts keep him informed on various events and gossip of the trade; subordinates act as his filter, sending in information on external events; trade organizations routinely feed the chief executive special trade information by way of reports and newsletters; the chief executive subscribes to a wide variety of periodicals, which carry a steady flow of information on events in the trade, in technology, in business in general and in the world at large.
> (Mintzberg, 1973:68)

Aguilar (1967) has identified four different types of information source available to the manager, two personal (company personnel and external personal contacts) and two impersonal (internal reports and external publications). Using this basic framework, eleven sources were identified for this survey:

Personal sources: Company personnel: External personal contacts

Internal sources: Internal reports: Own library/ information unit

External sources: Professional/trade journals: Newspapers & periodicals: Government reports: Professional/trade associations: Other libraries:

Electronic external information services: Commercial databases: Videotex

The general results of the findings on use of information sources are discussed below.

6.3.2 Personal sources

The idea of the manager at the centre of a network of informal contacts has been best described by Mintzberg. The chief executives in his survey had all developed 'networks of informers - self-designed external information systems' (1973:45). He sees the manager as

having a unique role in monitoring and disseminating information:

> The interpersonal roles place the manager in a unique position to get information. His external contacts bring special outside information and his leadership activities serve to make him a focal point for organizational information. The result is that the manager emerges as the key nerve center of a special kind of organizational information. (Mintzberg, 1973:57)

Studies of managerial work have frequently drawn attention to the manager's preference for verbal communication; Stewart's diary survey (1988) found managers spending 50% of their time in discussion, mainly of an informal nature, while Hill's study of middle managers (1985) put the figure at 58%; Mintzberg's in-depth study of five chief executives estimated that 78% of their time and 67% of their activities was spent in verbal communication (1973:38). Because he wants information quickly, the manager is prepared to put up with the uncertainty that goes with verbal communication and 'prefers gossip, speculation and hearsay' (1973:36)

Aguilar's study (1967) found personal sources far exceeding impersonal in importance (1967) and Keegan's research (1967) showed that 67% of all important external information came from human sources. Kefalas and Schoderbek noted 'informal meetings inside' as the preferred source (1973:73). White and Wilson found the extent to which managers used personal contacts to get

information an outstanding feature of their survey (1988: 27).

In this survey also, personal sources were highly rated as a means of gaining external information. External personal contacts came first in the mean ratings and Company personnel fourth. Case study respondents also stressed the importance of personal contacts as sources of external information.

6. 3. 3. Company personnel

The larger the company, the more 'internal experts' it has and the more developed its formal communication network. (Mintzberg, 1973). Aguilar has noted that managers in large companies rely much more on inside sources because of the existence of 'institutionalised search units' or the potential advantage of 'having 10,000 people on the end of the phone who can and will provide information and answers' (1967: 96).

The findings of Aguilar and Mintzberg that larger companies place greater importance on company personnel is not borne out by the findings of this research, where no significant differences by company size were noted. Even where companies had libraries, however, use of personal contacts was often preferred to direct access. The information officers in companies B and C both described how requests were filtered down in this way from top

management level (p103, 114). Such examples illustrate the numbers that might be involved in an information search.

The different ratings by functional groups were more significant than ratings by company size. Marketing managers placed a high rating on Company personnel and were the only functional group to put internal contacts ahead of external. The marketing manager in the electronics company (Company G) provided the best explanation for this with his description of the use of company salesmen to collect market intelligence as a routine part of their work (p146).

6.3.4 External personal contacts

Both Aguilar (1967) and Mintzberg (1973) have pointed to the manager's reliance on a 'personal network of communications' particularly among top level managers. Aguilar found that 62% of the information coming to managers from outside sources was 'unsolicited', showing how well developed these personal networks are.

The emphasis on personal contacts applies to small firms as much as large. Capital Planning Information (1982, 1985) found most information in small firms was passed verbally, mainly through trade contacts, with 65% of small retail firms seeing customers and suppliers as an important source of information. These surveys also show

that managers will make use of sources they know, emphasising again the importance of building up contacts.

This strong evidence from a number of research studies of the importance of external personal contacts to the manager is supported by the evidence of this research. External contacts came first in the mean ratings with a score of 3.16 on the four-point scale and was rated 'very important' by 38% of respondents. All functional groups rated this source at 3 or above.

Librarians and corporate planners placed Professional/ trade journals slightly ahead of External personal contacts, showing a difference in emphasis between those respondents who were 'information providers' and those who were predominantly 'information users.'

Among those who were making no use of electronic external information services, External personal contacts were the only source to be rated at 3 ('important'). With the extensive user group also, it was in first position, jointly with Professional/trade journals and Own library/ information service. Access to a wide range of alternative sources therefore appears to make little difference to the importance placed on personal contacts.

All managers in the case studies spoke of the importance of external contacts. They were vital in the electronics company (Company G) for market intelligence information, for 'cloak and dagger' operations like

finding a rival company's market share (p142); in oil (Company D), for acquisitions and mergers information, for finding out which North Sea companies were changing hands (p122); in the construction industry (Company F) for getting access to confidential information on potential acquisitions (p136). This use of personal contacts where information is not publicly available has also been pointed out by White and Wilson (1988) in whose case studies personal contacts were seen as the best way of getting market intelligence.

Aguilar's finding that external contacts were especially important at the top management level was supported by three respondents in the case studies. In the construction company (Company F), the Chairman was making important business and political contacts through his committee-membership (p134) and there were similar examples in Companies B (p103) and D (p121).

Managers and librarian/information officers were also part of 'information networks ' within their particular industry and were relying on personal contacts within these to provide them with information. For example, the marketing manager in the small oil company (Company D) saw the telephone as her most important source of information, to give her contact with others in the industry (p122). All librarian/information officers interviewed had contacts with colleagues in other companies and, within

the limits of confidentiality, would be able to call on these for information. Information would be obtained more quickly by this method than by consulting publications. This need for speed was emphasised by several respondents.

The evidence in favour of personal contacts as an important source of information is therefore very strong. As the survey has shown, users of external information services and non-users alike place equal value on personal contacts. In sensitive areas such as market intelligence and acquisitions and mergers (see 6.2.4), much information will only be available from personal sources and this situation is unlikely to change, whatever new technological developments may arise.

6.3.5 Internal reports

Mintzberg in his detailed study of chief executives noted that little importance was attached to the internal report. He observed that chief executives would react more to 'active ad hoc' mail than to routine reports (Mintzberg, 1973:36). The routine report would contain gradual trends rather than the 'tangible' information that he was looking for.

There was no strong evidence from the survey results to support this view. Internal reports ranked fifth in the mean table at 2.77, just ahead of Own library/ information service. They were rated 'very important' by 20% of respondents and 'not important' by only 4%. There

were no significant differences by industry, functional group or company size. Low users of external information services gave them a particularly high rating (3.03), suggesting a greater reliance on internal sources by those who did not have access to a wide range of external information services. In Company G, it was pointed out that information was often out of date by the time it appeared in routine reports (p144).

6.3.6. Own library/information service

This section looks at the company library as a source of external information. Discussion of the library's role in the light of developments in information technology will be found in 9.2.

As both Blagden (1980a) and Lester (1984) have pointed out, libraries are only one of many sources which the manager will use for information. Keegan's research (1967) earlier showed that an extensive library was only a small part of the company's information system. Aguilar (1967) does not mention company libraries at all as sources of external information, though he does propose the setting up of 'central intelligence units' which would have a very similar function to some of the information services reported in the case study interviews. Mintzberg too makes no mention of libraries, but he sees a role for the 'information analyst' who can do the manager's scanning and filtering for him (1973: 150). Keegan (1967) suggests

the setting up of 'documentary surveillance units'. Culnan (1980) looked at the ability of the library to act as a boundary spanner and found its role affected both by the climate of the organization and its financial support and by its degree of proactivity .

The sharp division between the management literature and the library literature in its treatment of information issues is noted by Roberts and Clarke (1987) and is apparent in the literature survey for this research (chapter 2). In many studies of library use in industry, much play is made of the low status of the library and the problems this causes as the library attempts to take on a wider role. Slater found that while information ranked eighth in a list of sources, the library ranked eleventh, with the traditional library providing a 'fairly low-key background interest' (1984a: 28). She attributed this evidence of non-use to the image of the librarian and the preference for alternative sources, with the lack of information-consciousness in society leading to a low status for the library. Her results suggested that use of a formal library-information provision could make very little difference to the way a manager did his job; 50% of library users, 50% of non-users and 49% of those with no company library reported problems in getting information. This must of course be set in the context of the differing

interpretations of 'library' and the high expectations which a good library service will generate in its users .

The Technical Change Centre (1983) noted a pressure on libraries to change as more use was being made of external services. Nicholas, Harris and Erbach (1987c) in a study of journalists on the Guardian found the library, which was used mainly for press cuttings, criticised as 'too passive' and noted the low status of libraries compared to the high value placed on informal sources. Singleton's survey (1982) reported libraries closing down and budgets being restrained due to the low priority given to the library and Wilson (1981) noted that the transfer from special libraries to information units had resulted in libraries being 'marginal' to industry and therefore vulnerable. Vickers' picture of the information service functioning more like an intelligence service seeking out information on competition and the market (1984b) fits uneasily with this picture of low status. Some suggest that the librarians themselves are to blame for this situation. Nicholas, Harris and Erbach (1987c) think librarians have failed to see wider information opportunities and often do not know what information services are available in other departments. To Roberts and Clarke (1987) this presents a paradoxical situation with librarians dismissive of managers' use of information and managers viewing information use as non-problematical.

In this research, the survey results and case study interviews present a mixed response to library use and a number of different approaches within companies to library and information provision. Overall, 80% of respondents had access to a library of some kind. Own library/information service was in fifth place as an information source, after personal sources and publications.

There were very significantly higher ratings for company libraries from the pharmaceutical and oil industries ($p=.0065$) and from 'information providers' in the librarian and corporate planning groups ($p=.0000$). The importance attached to the library also increased with company size ($p=.0065$) and with usage of external information services ($p=.0000$). Own library/information service and Commercial databases were the only sources to show significant differences when tested against all these variables. The results mirror the distribution of libraries noted in 4.10.3. Libraries were found in virtually all oil and pharmaceutical companies, but were not so widespread elsewhere and possession of a library increased significantly with company size ($p=.0002$) and with external information service use ($p=.0079$).

Attitudes to libraries by those respondents who had company libraries are given in Appendix V, Tables A32-35. Libraries were regarded more highly in the oil and pharmaceutical industries, where there is a long tradition

of library use than in other industries, and this must reflect the type of service which is available and the expectations which managers have of it.

In the light of library research evidence of lack of use of company libraries and their low image within the organization, it is instructive to note the survey results on respondents' attitudes to their own library/information unit. 73% of librarians regarded their libraries as 'very important', but only up to 30% of respondents in other functional groups who had access to a library gave them this high rating. Information providers and information users therefore showed very different perceptions of the value of the company library for external information.

The term 'library' covers a multitude of different types of service, from a shelf of books to a professionally run information service. Some respondents qualified their answer 'yes' to this item in section 3 of the questionnaire with 'but small' or 'limited'. Ratings are clearly affected by the type of library provided, as the high ratings in the oil and pharmaceutical industries testify. Indeed, in some instances, respondents within one company would differ in their replies as to whether they had a library or not. This was no doubt due to the existence of small specialised libraries within certain departments, as in Companies F (p132) and G (p143).

Blagden's study (1980a) of the use of the British Institute of Management library confirmed the view that libraries only reach a small proportion of their potential market, but that those who do use them, benefit. Among the case study firms, three were providing conventional library services and in each case the librarian commented that use depended much more on individual interest than on the particular job. The interviews with the librarian and marketing manager in the smaller oil company (Company D) revealed on both sides an ignorance of what information could or should be provided.

The trend away from scientific information to wider-based strategic information has been noted by Moores (1981) and by the Technical Change Centre (1983) in its survey of library and information units, which revealed more provision of information to marketing and planning departments, with a shift away from technical to commercial and market information. The information service in the larger oil company (Company C) provided an example of this trend. Its own service over the past few years had developed in this way, when it was found that business and economic external information was needed for decision-making in addition to the technical information that it had traditionally provided (p110).

In the case studies, corporate planners emerged as an important user group in several of the libraries or

information units visited. In the larger pharmaceutical company (Company A), the economics and external studies group were making heavy use of the library for long-term projects such as researching new markets (p94). In the smaller oil company (Company D), enquiries from business development staff were the most lengthy and detailed (p117). In the large retail company (Company E), the Economic Information department itself had a clear role in alerting Board members and executives to strategic issues (p128). In the larger oil company (Company C), the formation of a Competitor Group had been instrumental in the development of the information department's business and economic information side (p110).

Marketing managers were the second new target group for libraries identified in the Technical Change Centre study (1983). There was evidence from the case studies that marketing departments were more likely to set up their own information departments or services than use a central resource. In the two companies where interviews were held with both a librarian and a marketing manager, the latter did not appear to be making much use of the library. The marketing manager in Company B was using the library mainly to consult journals and documents and found it quicker to search databases by electronic mail to the company's US Head Office than to go along the corridor to ask the librarian to do the search for him (p107). In the

smaller oil company (Company D), the marketing manager acknowledged that she was not making enough use of the library and appeared unfamiliar with the services it had available, using it only to consult books and journals. She preferred to solve her own information problems, feeling that this would be quicker than going through the library (p123). These examples point to the need for speed in information provision and for a responsive service.

In Company B, the demands from marketing staff were seen as creating a tension in a library service which was funded as part of R & D to provide only scientific information. The librarian felt that his role in providing a wider information service was not yet recognised by the company (p99). This was an illustration of a library in an early stage of developing its services outside the technical and scientific areas.

The view of the traditional library as a source of documents rather than of information was noted in Slater's research (1984a). From this study, it would appear that this attitude is encouraged by the administrative role that libraries often have for the central ordering of books and journals, which may be proving an obstacle to the development of such libraries into more pro-active information services.

With so many different types of library and information service, it is difficult to judge the ranking

of Own library/information service on the basis of the survey results alone. What has emerged from the case study interviews has been a variety of different approaches to information use as the information management role grows in importance. There were examples from the larger companies of information units which were adopting a more responsive and outgoing role. There were equally examples of more conventional library services which appeared not to be conscious of, or to be fighting against, the need for change. Particularly outside the oil and pharmaceutical industries, there were also examples of large organizations which had no tradition of central information provision at all. In these cases, either individual managers were using their own systems for collecting external information or an alternative strategy based on the system management function was being developed. The changing role of the library/information unit and its place in the company structure as computer information systems develop is explored in 9.6.3.

6.3.7 Professional/trade journals and Newspapers and periodicals

While demonstrating the importance of verbal sources, Aguilar (1967) also acknowledges the role of printed media, in particular in relation to strategic information. In his overall data, 18% of responses came from 'outside members ' and 19% from 'publications'. In the sample

which related to strategic responses only, 27% were from publications and only 10% from outside members. Of this 27%, 18% was newspapers and 9% trade publications. 79% of responses relating to newspapers were 'strategic responses'. The manager in a new job was likely to make more use of published sources until he had had time to build up his own network of personal contacts.

White and Wilson report similar findings in their case studies of manufacturing firms. With 79 respondents asked to rate a list of sources as 'useful' or 'very useful', 94.9% cited personal contacts outside the firm, 92.4% journals and 87.3% trade literature. Most comments related to the journals of their own market or industry (1988:22).

This survey too showed very little difference in ratings for printed external sources compared to personal contacts. Professional/trade journals and Newspapers & periodicals were in overall second and third places in mean ratings and were the only other sources to be rated at 3 or more on the four point scale. While acknowledging the reliance on personal contacts, it is important to recognise that managers put an almost equal value on printed sources. particularly those that are industry-specific. In fact, an equal proportion of respondents (38%) rated Professional/trade journals and External personal contacts as 'very important'.

Highest scores for Professional/trade journals came from the pharmaceutical industry ($p=.0448$) and from librarian respondents who placed both types of printed source above External personal contacts, as also did the corporate planning group. Aguilar noted that the higher a manager's level of responsibility, the less frequent use he made of publications, the task of screening being left to subordinates (1967:77). The emphasis in this study is to be expected, with librarians and corporate planning staff acting as 'information providers' and often scanning the literature before passing on important information to senior management.

In comparing replies in the survey in relation to external information service use, both Professional/trade journals and Newspapers & periodicals had a higher score in the extensive user group, suggesting that a level of information awareness is at work here.

A number of studies have looked at the way managers use published sources. Blagden in 'Do managers read?' (1980a) took a sample of British Institute of Management members and looked at reading habits. His managers claimed to be spending an average of 7.8 hours a week reading, rather more than Stewart's diary survey (1988) which found reading accounted for 2% of a manager's time. In Gent's survey of managers in electronic firms (1987),

reading occupied 10-30 mins of each day, about half being done at home.

Mintzberg's study of five top managers provides detailed information on reading habits. Managers taking part in the study received on average 20 periodicals a week (Mintzberg, 1973: 39), but these were handled 'in an almost ritualistic manner', with action being noted only in relation to 4 items out of 102 received during the period of study, the rest being quickly skimmed. In keeping with their interest in 'current, trigger' information Mintzberg noted managers reacting more to mail that dealt with 'concrete, live situations' than to regular periodicals. This was also the case with the Marketing Manager in Company D, who found the oil industry's weekly journals of great importance, with the monthly periodicals providing background interest (p122).

Gent found 190 different newspapers and journals listed by respondents, an illustration of the range used even within one industry. Managers reported that an average of 6.908 journals were regularly read and that journals were their main source of market intelligence. In a survey looking specifically at the needs of marketing managers, Fletcher (1983) found 67% of respondents citing journals as an information source.

While this survey did not attempt to measure the amount of time spent reading, or the number of titles

read, the evidence from the case studies does provide a picture of reading habits which supports the survey results. Trade literature was particularly important, as one respondent pointed out on his questionnaire:

> "The databases that we have access to are used for general queries. Any detailed information about our own industry is best found through trade publications and magazines and market research." (Marketing and sales operations manager, large electronics company)

Keeping up with the literature is a problem reported by managers across all these surveys. Aguilar noted that there were few companies with systems for scanning management and commercial publications comparable to those that existed for technical publications (1967: 89). This is an area where there do appear to have been developments since Aguilar wrote. Among the librarian/information officers interviewed for the case studies, the provision of up-to-date information from newspapers and specialist journals was often one of the specific services provided. In the large retail company (Company E), up-to-date information was regarded as so important that the Economic Information department was receiving Press Association tapes to get news in advance of its publication (p130). In the survey results, Newspapers and periodicals were a particularly valued source in the retail industry, with 50% of respondents regarding them as 'very important'.

As McGrother has shown (1987) the coverage of business in the quality press is excellent. While there was a

preference among managers for trade journals, daily newspapers such as the Financial Times were also read. Certainly scanning the newspapers for up-to-date information was an important activity in a number of the companies visited.

6.3.8 Government reports

In fifth place overall, Government reports received a significantly higher rating from librarians (p=.0003) and from the pharmaceutical industry (p=.0058). This relates to the importance assigned to the areas of Legislation and Government policies within the Political environment by these groups (see 6.2.5.2). No further significant findings were identifed in relation to Government reports as a source of external information.

6.3.9 Professional/trade associations

Petts and Rennie (1986) investigated 36 research associations and found 22 providing business information or market research services. The Technical Change Centre (1983) found that research associations are used mainly by small firms or by large firms which are already 'information-conscious'. In the Capital Planning Information study of small manufacturing firms (1982), trade associations and contacts were found to be an important source of information. In their study of small retail firms (1985), 35% of respondents were in national trade organisations and 18% in professional societies.

Slater (1980) found 21% of respondents using professional societies and 13% research associations, compared to 41% of respondents who used public libraries. White and Wilson (1988: 25) found trade and research associations frequently cited. They were seen as a useful way of keeping informed on developments and as a means of making personal contacts.

There was no strong evidence from the survey results of frequent use of trade or professional associations. These were in seventh place in the table of ratings, with a mean score of 2.66 on the four point scale and considered 'very important' by 16% of respondents. There were no significant differences by industry group, but where most sources received their highest ratings from librarians, professional/trade associations were more highly rated as information sources by the finance and management services groups, who put them in joint third and fourth place respectively. This is no doubt because of the range of outside financial services available (see 8.4.6).

Evidence from the case studies suggests that to some managers trade associations are more important than the overall survey results would suggest. In Company G, the two managers interviewed spoke highly of the market intelligence services provided by the Society of

Electrical Appliance Manufacturers (p142) and the British Radio Electronics Manufacturers Association (p147).

Though not a professional/trade association as such, it is worth noting here that in the pharmaceutical industry, the major source of information noted in this research is currently IMS (International Medical Statistics). This provides a similar service to that of the electrical manufacturers associations. The service produces the audit sales of pharmaceutical products in Western Europe and also offers a range of information on database form, an example of the more advanced information available in the pharmaceutical industry.

6.3.10 Other libraries

Some research studies have looked specifically at public library use and their findings show a general lack of awareness of the services on offer. In the Capital Planning Information surveys (1982, 1985), only 9% of the manufacturing firms used the public library, which was regarded as an 'under-used' resource and while 23% of small retail sample had contact with the public library, it was most frequently used for names and addresses and only half this number regarded it as an important source. Slater found more evidence of use, with 38% of respondents citing outside libraries as an external source of documents (1980: 90). White and Wilson (1988) noted use of local business libraries, but not as a first resort. In

the construction industry, Shoolbred (1987) found that slightly over half his respondents made occasional use of the public library and that the specialist RICS library was never used.

In the survey, Other libraries/information units came in ninth place out of eleven sources of external information in the mean ratings and were rated 'very important' by only 16% of respondents. They received a significantly higher rating of 3.36 from the librarian group (p=.0000) and were rated below 2 by management services and systems managers. As with company libraries, there were significant increases by company size and by use of external services.

Evidence from the case studies confirms this finding. Public libraries were mentioned by only two respondents, both librarians from smaller companies (Companies B and D). Specialist industry libraries, including those of competitor companies were mentioned more frequently, but some respondents while commenting on the general helpfulness of informal industry contacts drew attention to the issue of confidentiality which would affect the type of query that could be put to an outside source.

It would seem that other libraries suffer from the same problems of lack of awareness as company libraries themselves often do. Their main users are librarians who have their own network of contacts. Managers may use

libraries with which they are familiar, but will tend to go for personal contact, even if their enquiry is in fact answered from library resources (see p175).

6.3.11 Commercial databases

The number of commercial online databases of relevance to the business community has increased rapidly over the past few years. The market has grown from the bibliographic databases introduced in the 1960s primarily serving science and technology to the wide range of financial, full-text and company information databases available today. Previous research has shown little evidence of managers placing value on these commercial databases as a source of external information. Slater's investigation of non-use of library and information sources among a group of professionals found databases ranked last out of twelve information sources, with many people not knowing what they were (1980:90). None of the managers interviewed for the Roberts and Clarke case studies of manufacturing firms (1988) were making use of online, a result which they felt was characteristic of most firms in the manufacturing industry apart from the very largest. White and Wilson also noted the 'virtual non-use of online databases' in this survey (1988:39). The Capital Planning Information survey of business databases in the UK (1983) suggested that, apart from libraries, most database subscribers are large organizations. Their

own surveys of small manufacturing and retail firms (1982, 1985) showed little awareness and use of online databases.

In a study of the reading habits of managers in the electronics industry sent out by BIS Infomat, Gent found that databases had the lowest number of citations for market intelligence. 57% of respondents never used databases for information on overseas markets and only 13% used them frequently (Gent, 1987:36). Willis looked at users of business databases in a survey distributed by database hosts. She noted that usage had increased over the past few years, with 33% of searchers being information specialists (1986).

Increased use of online databases by librarians/ information officers is also noted by the Technical Change Centre (1983). In their survey, 89% of library and information service respondents had increased use of online services in the past few years. Withers' research looked at those libraries using information technology and found 86% with access to databases (1985).

Surveys in other countries show a similar pattern. The survey by Maguire and Kench of Australian food and chemical companies found one-third of respondents were database users, but that most of this use was in the science and technology area through libraries which were part of R & D departments (1985). Methlie and Tverstøl (1982) in a survey of use of external information services

in Norwegian companies found databases ranked eighth in a list of ten sources overall, but ranked among the top three sources for new markets by larger companies.

While most of these research studies had been conducted in smaller companies, this study looks at the situation in larger organizations, but still shows little evidence of commercial databases being valued by managers as an information source. In the questionnaire survey, Commercial databases were ranked tenth out of eleven sources, with a mean of 2.34 compared to 1.64 for videotex. Where only 4% of respondents had rated videotex 'very important', 25% gave this rating to Commercial databases. Unlike any other source apart from Own library/ information service, differences in rating were highly significant by industry (p=.0000) and functional group (p=.0008) and there was a noticeable increase also in relation to company size. Those users who were making extensive use of electronic services (see 4.13.1) rated them significantly more highly than the limited users, with mean scores rising from 1.87 for limited users, to 2.19 for medium users and 3.00 for extensive users (p=.0000). Where videotex remained in last place for extensive users, commercial databases rose from tenth to fifth position.

The number of respondents using these services 'often' in every case exceeded the number using them 'seldom'.

Commercial databases were considered 'very important' to 45% of bibliographic databases users, 41% of company information database users, and 48% of those using full-text databases. The percentage of financial database users considering commercial databases 'very important' was somewhat lower (32%), a situation noted also in the results of the pilot survey. This appears to reflect a different pattern of use of financial services (see 7.2.4.4).

While managers in general appear to show little enthusiasm for commercial databases, librarians who form the highest proportion of extensive users (see 7.2.2) place a high value on them, rating databases at 3.45 and placing them in third position after Newspapers & periodicals and Professional/trade journals as a source of information. This rating was far in excess of the position for any other functional group, the nearest rating being 2.17 in corporate planning. All other functional groups put this in tenth place in the mean table.

All librarians and information officers in the case studies saw online databases as a valuable source of information, whereas managers interviewed showed comparatively little interest in the wide range of services available to them. Characteristics of users of electronic information services and the types of services

used are discussed in 7.2 and explanations for existing patterns of use are considered in Chapter 9.

6.3.12 Videotex (Prestel, Ceefax, Viewdata etc.)

This section deals with the value placed on videotex services as a source of external information and looks in general at the use that is being made of them.

Videotex is a generic term for any computer-based system which passes information to a television screen. In its simplest form, the teletext services, Ceefax (BBC) and Oracle (ITV), are providing free current news information, share prices and travel news through any specially adapted television set. British Telecom's Prestel system is an example of an interactive videotex system using a telephone link to the television screen. This enables the user to select from a much wider range of information and to interact with the system, for example to book travel tickets or holidays. Prestel is available as a charged service for both business and home use and contains a range of financial and business information. Services are put up by Information Providers, either for general access or to 'closed user groups' so that particular information can be made available for special markets. An alternative name for this type of system is Viewdata and many firms are operating their own private viewdata systems (see 7.1.4).

The Library Association (1982) sees Prestel and Ceefax/Oracle as services aimed at end-users rather than librarians, because of their ease of use compared to online databases. While Ceefax and Oracle have become widely available in the domestic market because they provide a free service, Prestel has often been described as an example of a technology which is searching for a use (Hills, 1982). As the ITAP report on 'Making a business of information' points out, its lack of progress provides proof that 'technology alone will not sell a service' (Information Technology Advisory Panel, 1983). Set up in 1978, Prestel was aimed first for the mass home market, but failed to achieve success. Its failure was blamed on a lack of marketing effort. It turned next to the financial and business markets and there its only significant success has been with the travel and holiday industry where it is now widely used. Sullivan and Oliver (1981) in a study of the use of Prestel for business information in a public lilbrary setting, found paucity of information and technological inefficiency the major disadvantages.

Piercy and Evans (1983) cite teletext and viewdata as important sources of marketing intelligence. There have, however, been few detailed studies of the use of videotex services in organizations. Withers (1985), in a survey of company libraries, found that 43% had Prestel, but that its main users were library staff themselves. Shoolbred

found only 14% of respondents in his survey of the construction industry had Prestel or private viewdata (1987: 196). He also describes the failure of the industry's own Contel system which was introduced as part of Prestel in 1979 and discontinued in 1982 (1987: 94).

In this survey, videotex came in last position in the mean rankings, with a mean of 1.64. 47% of respondents regarded it as 'not important' and only 4% as 'very important'. It was the only source to be rated below 2 on the four-point scale and received an equally low rating by industry, company size and functional group. Even extensive users of external information services rated it below 2.

Prestel was used by 49% of respondents and Ceefax/ Oracle by 42%. Only 6% and 8% respectively were using it 'often'. Isolating users from the survey population as a whole, (see Appendix V, Tables A34-35) made very little difference to the ratings. 36% of Prestel users and 54% of Ceefax/Oracle users regarded videotex as 'not important'.

Respondents from five of the seven companies in the case studies were aware of Prestel, but only two had actually used it at work. These were the manager of the Economic Information department in the large retail company (Company E) where the service was available but not widely used (p130). The only example of use that she

could give was checking on university vacancies for a director's daughter! In the construction company (Company F), the Systems Manager had been actively encouraging use of external information services. He had tried Prestel and found that though people appeared interested and keen there was little take-up of the service (p138).

There was just one example in the case studies of the use of Ceefax/Oracle. The service was being used 'all the time' in the retail company's Economic Information department (Company E) to check share prices, the value of the pound and travel news. It was available only in the library and was particularly heavily used when industrial disputes affected travel (p130). Considering that Ceefax/Oracle is so widely available and its information service is free, it was surprising not to find more examples of this type of use.

With this one exception, the case studies confirm the questionnaire results on lack of interest in Prestel and Ceefax/Oracle as information sources. Even though both services were available to about half the respondents, few were using either frequently and they were regarded as equally unimportant by their users and non-users alike. This was in sharp contrast to the importance attached to commercial databases by their users noted in 6.3.11.

6.3.13 Summary

This study agrees with earlier work in showing the importance to managers both of personal contacts and of publications. It also illustrates within the general framework of external information use, attitudes to company libraries and electronic information services which have not previously been considered in this context.

1. Personal contacts are the most important source of information for managers in all industries, whether or not they also have access to electronic information services. Personal networks of external contacts are built up and company personnel are also valued, particularly by marketing managers. The study shows that such personal contacts are especially valued as a quick means of getting sensitive information on competitors or on acquisitions and mergers which would not otherwise be available.

2. Publications come second in importance to managers, with those relating to the specific industry being of most value. The emphasis on personal sources has tended to obscure the almost equal value placed on publications, which is also evidenced by the number of press cuttings services encountered in this study.

3. Company libraries have not generally been considered as a source of external information in the management literature, and the library research literature shows a generally low regard. This study has highlighted the fact

that possession of a substantial company library is very much dependent on industry type and company size and that, even among comparatively large companies there are several that do not have this type of facility.

4. The value which librarians/information officers in this research place on their own libraries is very much higher that that placed by managers, illustrating a difference in perception between users and providers of information.

5. The research provides examples of different approaches to library provision, from more traditional R & D services in smaller companies to more fully-developed management information services in larger organizations. Corporate planners emerge as an important new user group, but from this study, it would appear that marketing departments are more likely to make separate information provision.

6. Commercial databases are in general held in little regard by the managers in large organizations taking part in this study. These services are, *however, very highly* regarded by their actual users, who mainly consist of librarians/ information officers or managers from the oil and pharmaceutical industries or the largest companies.

7. Videotex services are held in very low regard by their users and non-users alike and appear from this study to have very little importance to managers as a source of external information.

CHAPTER 7 ANALYSIS AND DISCUSSION OF SURVEY AND CASE STUDY INTERVIEWS II: INTERNAL AND EXTERNAL INFORMATION SERVICES

7.1 INTERNAL INFORMATION SERVICES

7.1.1 Introduction

In this section, results relating to internal information services (see 4.4) are analysed and compared with findings of external information services. The role of company libraries, which were also included in this section of the questionnaire, have already been discussed in 6.3.6.

7.1.2 Management information systems

Excluding libraries, this was the most widely available of the internal information services, with three-quarters of respondents reporting use. Use was evenly spread over industry groups, in contrast to the more uneven distribution of external information services (see 4.13.1). There was significant correlation with company size (p=.0261), but none with use of external information services. 62% of non-users and 73% of limited users reported access to Management Information Systems for internal information.

In the management literature, Management Information Systems are largely seen as providing internal control

information (see for example Dew & Gee (1973), Simon (1977), Tricker & Boland (1982), Morden (1985)). In Mintzberg's view, this makes them largely irrelevant to the senior manager:

> These characteristics (needs for current, trigger and verbal information) put the manager in direct conflict with most formal information systems. He seeks trigger, speculative, current information, but the formal system gives him largely aggregated, precise, historical information. Furthermore, the manager demonstrates a thirst for external information , whereas formal systems provide largely internal information. (Mintzberg, 1973: 149)

This view was echoed by a case study respondent, the marketing manager in an electronics company (Company G), who suggested that the internal data which the firm's computer Management Information System produced was little used, except to 'tinker with' figures so as to show increase over target, as most needs were for external information which the company's information system could not provide (p149). Pfeffer and Salancik hold a similar view:

> Most formal organizations generally have very good internal reporting systems, while they are relatively weak in attending to changes in the environment. (Pfeffer & Salancik, 1978: 81)

In the case study company, the respondent was maintaining his own personal files of external information which were of more use to him than the company's formal information system (p148). Mintzberg sees this dichotomy as inevitable:

> As a result the manager must often ignore the formal information system, Instead he designs his own system, which provides him with the information which he believes he needs. He develops external contacts, subscribes to periodicals, joins trade organizations and encourages subordinates to circumvent the established lines of communication to bring him information. (Mintzberg, 1973: 149)

Opinions differ on whether external information can be organised in such a way that it can be combined with an internal information database. Roberts & Clarke feel that the combination is possible, given a change of attitude towards information issues:

> It is sometimes claimed that the task of abstracting needed information from the external environment in a systematic, comprehensive, fashion is impossible. Informal and by association, flexible information systems are advocated. ..The impression conveyed by this class of contribution is that the acquisition of information is a relatively straightforward task not requiring close study, and certainly not requiring any particular skills of those given the task of obtaining such information. It is arguable that current expressions of dis-satisfaction with the poor performance of formal planning and strategic systems may have as their cause inappropriate attitudes towards information issues. (Roberts & Clarke, 1988: 105)

These findings show that companies have so far placed greater emphasis on the development of computer systems for internal information. The electronics firm in the case studies (Company G) provided the most obvious example of this approach.

Woodling (1986) looks to the setting up of corporate intelligence networks which will co-ordinate environmental

scanning activities and encourage greater use of external information services. From the case study evidence, attempts to combine external and internal information in one database are now being made. The marketing manager in the smaller oil company (Company D) described a new development involving the installation of a software package to allow manipulation of external and internal data linked to the company's mainframe computer (p124). The larger oil company (Company C) was daily extracting from an external database share prices, oil prices and exchange rates for incorporation in its MIS and was developing a far larger project which would give managers both external and internal information, incorporating a separate interactive database with graphics facility for senior managers. The type of external data being incorporated in this way appears so far to be somewhat limited and it is uncertain whether the MIS originally designed for the manipulation of control data will prove an appropriate medium for the more sophisticated types of external information.

7.1.3 Marketing Information Systems

Just over half the respondents reported availability of Marketing Information Systems, with a higher proportion in pharmaceuticals than in other industries. As with Management Information Systems, there was significant correlation with company size, but in this case also a

marked increase in availability by use of external information services. Numbers accord with Fletcher's survey of larger firms, which found that out of a sample of 117 firms, 63 (54%) had Marketing Information Systems, but that one-third of these were not providing any information on the environment (Fletcher, 1983). Jobber (1977) similarly found in a survey of US and British firms that around 40% of respondents were using Marketing Information Systems for review and retrieval purposes only. In Company B, information provided by the IMS database MIDAS was being used alongside the company's own product database to act as a Marketing Information System (p107). Other case study respondents were using information from market research organizations or trade associations to compare their own market share, but this information was not generally being incorporated into a marketing information system as such. The Information Systems Manager in Company G recognised this as an area that needed attention (p144). Given the importance attached to competition and market trends (see 6.2.2), it is surprising not to see more such examples of attempts to combine internal and external information in Marketing Information Systems.

7.1.4 Private viewdata

Firth (1983) cites a dramatic growth in the private viewdata market over the past few years because of its

ease of distribution and of access. Private viewdata systems were less prevalent in this survey than either MIS or MkIS, with about one-third of respondents reporting availability. Two respondents reported that this service was scheduled shortly. There was little difference by industry, and again differences by company size and external information service use. As they use the same technology, some correlation could be expected with use of Prestel and Ceefax/Oracle services, but survey results did not show a significant overlap, with several respondents using one example of the technology without the other. For example, the electronics company in the case study (Company G) was one of the country's largest users of private viewdata through their dealer network, but used Prestel only as an advertising medium (p143).

7.1.5 Online database for company information

These were available to 38% of respondents, making them slightly more common than private viewdata. They were most often found in the pharmaceutical industry, where over half the respondents reported access. Use was again significant by company size and apart from the library, this was the only internal information service to be significantly correlated with use of external information services (p=.0128). There was also significant correlation with bibliographic and financial database use. Unlike the Management Information System, therefore, an

online database for company information was unlikely to be found in companies that were not also high users of external information. One pharmaceutical respondent saw the company information database as the means by which managers would gain access to external databases:

> We also have internal information on Datastar so numerous departments now use this host as a matter of course and have access to all other databases. (Divisional librarian, large pharmaceutical company)

Examples of the use of online databases for company and competitor information were seen in case study companies C (p111) and E (p129). The library in Company B illustrates the need for such a system to be developed with its collection of product files (p103).

The high importance attached to market trends and competition as areas of external information (see 6.2.2) suggests that this is an area where product or market specific computerised external information could be of great value. Trade associations (see 6.3.9) are to some extent filling this gap, but, with the exception of MIDAS for the pharmaceutical industry, these services are not yet available in a convenient database form.

7.2 EXTERNAL INFORMATION SERVICES

7.2.1 Introduction

As seen in 6.3.12, neither Videotex nor Commercial databases achieved high scores in the mean ratings of sources of external information. Videotex consistently came in last position, considered 'unimportant' by its users and non-users alike. With Commercial databases, however, the situation was different. While respondents in general did not give them a high rating, those respondents who were using the services rated them much more highly. The following sections examine who are the users of external information services, and what services they are using.

7.2.2 Individual use of external services

As has been explained in 4.13, respondents were divided into four categories according to the extent to which they were using external information services: non-users (13%): limited users (1-2 services) (25%): medium users (3-4 services) (22%) and extensive users (over 5 services) (40%).

All librarians were making some use of external information services and 82% were in the extensive user group. This accords with the Technical Change Centre's finding on the importance of online services to industrial libraries. Librarians/information officers made up 37% of

the extensive user group, a similar proportion to that noted by Willis (1986).

Overall, therefore, 49 respondents (40%) were classified as extensive users with access to five or more external information services. This figure, however, gives a misleading impression of the extent of use of these services within the survey companies. There were considerable differences by industry group, with the pharmaceutical industry providing 45% of the extensive users and comparatively low use elsewhere (see 4.13). In the same way, there was a marked correlation with company size, 67% of extensive users coming from large companies. This group formed 65% of total extensive users. Only three extensive users came from small companies. With non-users and limited users, on the other hand, the majority were from small companies. Only three respondents from large companies (6%) were non-users and only seven (13%) limited users.

As well as the bias noted because of the high use in the pharmaceutical industry, the study of non-respondents described in 3.4.4.2 suggests that the total percentage of non-users, particularly in smaller companies may well be higher that the survey results would suggest. Questionnaire comments on the limited use being made of external information services came predominantly from the smaller companies. This included three small oil

companies, in marked contrast to the extensive use noted in larger companies in this industry. In general the non-user group comprised mainly those from the retail (44%) and electronics (31%) industries and respondents from the systems/computing (31%) and marketing (44%) areas. Non-users gave a particularly low rating to Current affairs as an area of information and gave only External personal contacts a rating of 3 ('important').

Among functional groups, librarian/information officer respondents formed the largest single category of extensive users (37%). As the highest proportion of librarian respondents came from the pharmaceutical industry, figures for the pharmaceutical industry and librarian respondents need to be read in conjunction with one another. Eighty-two per cent of librarians/ information officers taking part in the survey were in the extensive user group. Only one librarian, from the oil industry, was a non-user and his situation was likely to change shortly:

> As you can see very little has been done in the field of external information via computer link-up. We rely heavily on printed sources...but as I write moves are afoot that if successful will bring [the company] into the 21st century ie a fully automated, computerised data management system 'CALM' and the ability to go online to various data-hosts and centralisation of all departments in the area of library information. (Librarian, small oil company)

The survey results thus point to high and valued use of commercial databases within libraries/information units,

particularly within the pharmaceutical industry, which has a long tradition of information use (see 8.2.1). Use is particularly low in the retail industry, where 44% of respondents were non-users. From the survey results, it would also appear that systems and marketing managers with only 10% and 12% extensive users are also not making as much use of these services as their colleagues in finance, where 24% of respondents were in this category. These figures for individual use need to be seen in conjunction with departmental use of these services, which is discussed in section 7.3.3.

With so many librarian extensive users, it is not surprising to find a correlation between use of external information services and possession of a company library. 92% of extensive users but only 56% of non-users had access to a company library. There was also a strong correlation between use of external information services and the rating given to Own library/information service as an information source. In looking at availability of external information services (see Appendix V, Table A30), extensive users were more likely to have access to a central service and a secondary service based in department or location, whereas services among non- and limited users were concentrated in individual company divisions or functions.

Most librarians and information officers in the case studies were making extensive use of online services. More details of the services available in each library or information unit are discussed in Chapter 5. Use of individual external information services is examined in 7.2.4.

Use by managers in the case studies was less intensive. There were examples of managers making heavy use of financial databases (p124) and of specialised pharmaceutical databases (p107), but little interest was shown in the wider range of services now available. There were instances also of unsuccessful trials of databases by the marketing manager in Company G (p149) and the systems manager in Company F (p136-8).

These examples illustrate the very different approaches to external services adopted by managers in different organizations. This relationship of external information use and company structure is discussed in 9.6.

As a group, therefore, extensive users of external information services have several features in common; they are most likely to be librarians/information officers, to be working in the pharmaceutical industry or in large companies within other industries. Their use of videotex is infrequent and they do not rate it highly as a source of information. On the other hand, they are more likely to be using commercial databases 'often' rather than

'seldom' and give them a fairly high place in their mean rating of sources, with almost half extensive users regarding commercial databases as 'very important'. They place a high value on all sources of information compared to other user groups, particularly on Own library/ information service. Where users are not librarians, they are most likely to come from the finance or corporate planning groups and will almost certainly have access to a company library. External information services will be available to them both centrally and in divisions or locations. About half of them will also have an internal online database for company information. They place a significantly higher value on Current affairs and also rate Technological developments, Acquisitions and mergers, Government policies and Technical information more highly than other groups. .

7.2.3 Departmental use of external services

In the analysis of departmental use (see 4.6), Library, Finance and Marketing emerge as the main users, followed by Corporate planning. Withers' survey has also shown that the areas that benefitted most from external information service use were corporate planning, finance and marketing (1985). Except in the case of marketing, company use matches with the individual use reported above. Whereas over half the finance and corporate planning managers were extensive users, the percentage for

marketing managers was only 22%. Overall use by marketing managers may, therefore, be heavier than the survey replies from marketing respondents would suggest.

7.2.4 Individual external services in use

All seven external information services listed on the questionnaire were available to 40% or more of respondents (see 4.5). The external information broker was the most popular service, used by over 60% of respondents. There was no marked preference among the other services.

Looking at user groups (Appendix V, Table A28), use of an external broker remained high across all groups, and Prestel and financial databases were also preferred by limited users. All services, however, had some users from the limited user group. This indicates that there is no one service which is preferred above others by those who are making limited use. Any service can potentially be chosen. Use of individual services is discussed below.

7.2.4.1 Videotex (Prestel and Ceefax/Oracle)

The rating of these services as sources of information has already been discussed (6.3.12). The services were widely available, especially in larger firms, but little used and little valued. They received the lowest percentage of total mentions on the questionnaire grid, indicating that they were not used in many departments.

For both services, highest use was in management services, systems and marketing.

7.2.4.2 Bibliographic databases

Overall, 26% of respondents were using bibliographic databases 'often' and 19% 'seldom'. As with overall scores for external information use, this figure is deceptive, as use of this service outside the pharmaceutical industry was low. 81% of respondents from the pharmaceutical industry were using bibliographic databases, the majority using them 'often', compared to 54% of respondents in oil and less than 30% of respondents from other industries.

Long established for online searching originally in scientific, medical and technical areas, this was still the service preferred by librarians, 17 of whom (77%) were using it 'often'. The majority of bibliographic database users fell into the extensive user group, where this was the service most frequently cited by respondents. From the grid information, the greatest concentration of use was in Research & Development, where it accounted for 40% of total database use, compared to 17% of use in libraries. With company information databases, it was the service least likely to be used by limited users.

Services being used are listed in Appendix VII. Dialog was the most popular host system, followed closely by Datastar. Respondents listed a range of databases which

they were accessing through these systems, mainly of a technical nature.

The continuing popularity of bibliographic databases in spite of the number of newer services now available must in part be a factor of the development of industrial libraries and online searching in conjunction with R & D departments. Dialog was mentioned by a number of case study respondents, mainly for searching technical databases, as in Companies D (p120) and F (p138), but also in Company C for providing managers with North American industry news (p112). The Systems Manager in Company F had used Dialog for information on North American companies (p136), but had found its complicated access a problem for the manager who was not searching regularly and its high cost a deterrent to the inexperienced searcher. The high number of diverse databases that a host system will offer acts as another deterrent to use by non-specialists. Nicholas, Harris and Erbach quote an ICI information manager's view that end-users can only cope with one or two files, whereas Dialog presents them with hundreds (1987c:33). Given these difficulties, it appears likely that bibliographic searching will remain the province of the librarian, but from the evidence of this survey, it will remain one of their most popular sources.

7.1 4.3 Company information databases

Company information databases were among the most widely used, with 27% of respondents using them 'often' and 24% 'seldom'. Although pharmaceutical companies again produced the highest percentage use (74%), the difference was less marked than with bibliographic databases, with over 50% of respondents in oil and construction and over 30% in electronics and retail reporting use (see 4.10.4). In both the electronics and construction industries, this was the most widely used service.

Again, there was significantly higher use by librarian respondents (86%), who were most likely to be using this service 'often'. There was high use also in corporate planning (61%) and finance (58%), where it was being used 'often' alongside financial databases. This was also the service most used by marketing respondents (41%).

The interest shown in this service by individual respondents is confirmed by an analysis of the questionnaire grid (see Table 11). Here company information databases received 20% of total mentions, a higher proportion than any other external service.

An analysis of services in use is given in Appendix VII. Dun & Bradstreet was by far the most heavily used service, particularly outside the pharmaceutical industry.

Since the questionnaire survey was carried out in 1987, the Financial Times Profile business information service has been introduced. As well as providing a full-text database (see 7.2.4.5), this gives access to McCarthy Online and to the 1992 Spearhead database. McCarthy Online was being used by the Systems Manager in Company F for background information on potential customers (p137) and the Spearhead database was being used here and in Company E (p130).

An earlier experiment in the electronics company (Company G) had been unsuccessful. The marketing manager had cancelled a subcription to Datasolve (the forerunner of Profile) when he found the service was hardly being used.

7.2.4.4 Financial databases

Financial databases were used more heavily overall than any other service and were the most popular databases in the oil and retail industries. As was expected, use of these databases within finance departments showed the heaviest concentration of any database use, with 29% of total mentions. On the other hand, the proportion of use within libraries (14%) was lower than for other database types. Although librarians again formed the highest users, the use was not significantly higher as it was in relation to other database services. Nevertheless, the service was still being used by a higher percentage of

librarians (71%) than finance respondents (62%). As with other databases, there was also a significant increase in use by company size (see Appendix V, Table A15).

In relation to user groups, financial databases, with external information brokers, were the most frequently found services in both the limited and medium groups (see Appendix V, Table A28). Users of financial databases were less likely to rate commercial databases as 'very important' than were users of other types (see 6.3.11).

In the analysis of services (Appendix VII), Reuters emerges as the most popular financial service. One respondent describes his use of Reuters in this way:

> I can say that we do use Reuters systems extensively in the Treasury area. We find that this alone is able to satisfy our information needs when taken beside a continual flow of verbal information from a number of corporate banking relationships.
> (Group treasurer, large pharmaceutical company)

Datastream had only one user outside the pharmaceutical industry and other financial services were only being used by a few companies. Eckersley and Rennie (1984) studied the use of Datastream in City companies. They noted use mainly by research or investment analysts rather than librarians, but observed that the service was not being fully exploited and people were not fully aware of its potential. Nicholas (1987c), on the other hand, found that very few journalists on the Guardian were using Datastream and that the librarian did most of the

searching. Possibly the lower value placed on financial databases compared to other types may be due in part to this lack of awareness of all the services they offer.

Nicholas, Harris and Erbach (1987a) note that real-time services like Topic and Reuters are simpler to operate, so that they appeal more to end-users. The marketing manager of Company D indicated that for her, instant access to market prices and industry news was the key factor in preferring Telerate or Reuters to the historical data provided by other types of database (p124).

Financial databases were not generally available in the libraries of case study companies, and the common pattern was for finance departments to have direct access themselves. There were no finance managers interviewed in the case studies, so that detailed information on use of these services within finance departments is not available from this study.

7.2.4.5 Full-text databases

In the questionnaire survey, full-text databases were the least used of any group of external services. There was significantly higher use in the pharmaceutical industry (74%) and particularly low use in retail (12%), with use by company size also significant. This service had the lowest use among the limited user group.

Textline was started in 1980 as the first database of its type to be directed at the end-user business market (Foster, 1981). It was followed by World Reporter in 1983 and Nexis in 1984. Of the services in use (see Appendix VII) Textline emerges as by far the most popular full-text service, with heaviest use in the oil and pharmaceutical industries. World Reporter is second in popularity and other services listed (Magic, Newsline and Nexis) receive few mentions.

The popularity of Textline is confirmed by the case studies in this research, where it is the most frequently mentioned service. In Companies C and E, it was one of the most popular services, and the one most in demand by end-users (p113, 130). Nicholas notes that Textline is popular with business users as it is based on newspapers rather than academic journals and is very up-to-date. As a menu-driven service it is easy to use (Nicholas, Harris & Erbach, 1987a: 338-9). In addition to these reasons, case study respondents cited its subscription structure, with advance payment rather than individual search payment making it more appropriate for end-users (p130). The fact that it provided abstracts or full articles rather than bibliographic references was another key factor (p113).

In spite of this popularity with end-users, as with most other databases, there is significantly higher use of full-text services by librarian respondents (90%). For

this group, it was in joint first place with bibliographic databases. Low use in marketing (15%) was particularly surprising. From the information on the grid, individual evidence of low use in retail appears to be confirmed with only 7% of total mentions. Use in marketing (12%) is somewhat higher than individual replies would suggest. Withers (1985) in fact finds Textline the most used database in marketing.

From the case study evidence, it is clear that the Textline service (which is now part of the Reuters group) has been well marketed and become better known as a result. Comparing questionnaire survey and case study results, use of full-text services and of Textline in particular may well have increased since the questionnaires were sent out in 1987. It is important to note, however, that the predominant users remain librarians and that in the case study examples quoted use was in every case controlled by the library.

7.2.4.6 External information broker/bureau

Use of an external broker was more frequent than use of any of the videotex or database services listed on the questionnaire, with 23% of respondents using them 'often' and 36% 'seldom'. Unlike databases, there were no significant differences by industry, company size or functional group. This was the service most in use by limited users, who were using it either alone or in

conjunction with one other source. On the other hand, external brokers were also used by 82% of the extensive users group.

From the grid information, external brokers received the highest percentage of mentions in construction and retail. From individual responses and from company information included on the grid, use was highest in marketing, finance and corporate planning and lowest in systems and management services.

The picture is therefore of a service which is used as much by those who have their own in-house external information services as those who do not. White (1980, 1981) points to the slow growth of information broker services in this country, compared to the United States, and sees this as an area now ripe for development. There are indications from this research that such services are now being more widely used.

The heavy use of an information broker may be compared with the high ratings given to 'External personal contacts' as a source (6.3.4) and to ratings for 'Professional/trade associations' (6.3.9).

Respondents were not asked to name the external brokers used, so that the research findings can give only a limited picture of use of these services. Electronic external information services are of course available through other information sources, so that respondents

without direct access may well be making use of them through this route. This type of use in the financial area is mentioned by two respondents in the pilot survey:

> "Use of Datastream, Reuters etc is available through our brokers and merchant bankers although the need to have such services in-house is currently being appraised."
> (Business development analyst, oil company)

> "As not a large company, we will go for professional advice whenever we need it to supplement small HO management team. We have no internal tax, legal or such like experts but can control some marketing and financial based surveys.
>
> In addition one can define services to include data available at say Companies House, credit data banks, stock-broker Datastream terminals etc.
> (Group finance director, minerals company)

A retail respondent in the main survey makes the same point:

> We do not necessarily have access to information in-house - but we know it is available and where to get it eg from broker, merchant bank etc. I would say that we can put our hands on most information very easily and quickly.
> (Divisional director, Business Development, large retail company)

All the above comments relate to financial information, the use of which is further discussed in 8.4.6. As a general information service, three case study respondents (Companies C, E and G) were using the FT Information service, with varying degrees of success (p112, 131, 148). In the electronics company, both respondents also mentioned the market research firm AGB and its German equivalent GFK who were supplying them with retailer data

which enabled them to work out their own market share (p142, 147).

Though not external information brokers as such, it is worth recording here the use of consultants or market research agencies as sources of information. Several respondents in the case studies were using these services. For example, the Marketing Manager in the smaller oil company (Company D) explained that the company was paying a substantial retainer to two specialised consultancy firms to supply information (p123). The Marketing Manager in the electronics company indicated that his company was prepared to spend a great deal of money on market research surveys (p150). These examples point to a willingness to pay often quite substantial sums to get exactly the information required and demonstrate that cost is not always an inhibiting factor in external information acquisition. In fact, the marketing manager in Company G was suspicious of information that was available freely and felt it was necessary to pay a price to get the information required. The question of costs in relation to external information services is discussed in section 9.4.3.

7.4.7 Specialised databases

Respondents were asked to list the databases they used in addition to those listed in the questionnaire. Most databases listed in this way were specialised services for the particular industry. Predominant among these were the pharmaceutical industry's IMSBASE and MIDAS databases. The librarian and marketing manager of the smaller pharmaceutical company (Company B) both spoke of their use of IMS services (p102, 106).

Another example of specialised database use was in the larger oil company (Company C), where Scout data was bought in on tapes from Petroconsultants and loaded into the internal computer system. Keeping up this database and using it to answer queries involved a great deal of skilled programming work and much of the work of the Information Unit went into maintaining this database (p111). The electronics company (Company G) had also experimented with the use of tapes instead of buying in market intelligence information in printed form. They had found the system so unstructured that they felt the effort was not worth it. After this experience, the company has decided to wait until the firms supplying the information had themselves developed computer systems (p147).

CHAPTER 8 SUMMARY OF FINDINGS IN RELATION TO RESPONDENT GROUPS

8.1 INTRODUCTION

This chapter looks at the survey and case study results in relation to the three main respondent groups, analysed by type of industry, company size, and function of respondent. From the results presented, it is apparent that each of these has some impact on the way managers are using external information. Results relating to each group are summarised below.

8.2 TYPE OF INDUSTRY

The highest number of respondents was from the pharmaceutical industry (25%) and the lowest from construction (15%). There were sufficient respondents from each industry for valid comparisons to be drawn.

Aguilar found that conditions and trends in the particular industry determined which areas of information would be of most importance (1967:37). From the survey results in this research, industry emerges as the variable which produces the most significant differences in mean ratings, reflecting both the differing degrees of importance attached to information in general in each industry and also the particular preoccupations of the industries themselves. Case study results too show a

strong emphasis on industry-specific information. Results for each industry are discussed below.

8.2.1 Pharmaceutical industry

There were 31 respondents from the pharmaceutical industry, the highest of any group. Twelve of these (54%) were librarians and there were no respondents from the computing/systems function.

Companies ranged from giant multinationals, where pharmaceuticals was one of several major divisions to smaller more specialised companies. In the case of the larger companies, questionnaire replies were sought both from Head Office and from the pharmaceutical divisions. There were respondents from all but two small companies approached. All companies were operating internationally and six were US owned.

Haygarth Jackson describes the pharmaceutical industry in these terms:

> The pharmaceutical industry is a high-tech, high-investment and high-risk industry. It is also a highly competitive research-based industry and a dedicated and demanding user of information. It follows that the industry is in the forefront of information science and information handling techniques which use the new information technologies, both with respect to handling internally generated data and externally published materials.
> (Haygarth Jackson, 1981:75)

This view of the industry is amply confirmed by the results of this research. 71% of respondents were themselves extensive users of external information

services, a far higher proportion than any other industry group. This not only included all but one of the librarians, but also the majority of respondents from corporate planning, finance and marketing. Individual use of all database services was higher in this industry except for financial databases, where there was equal use in oil. There was a heavy concentration of services on the library (see 4.10.4) and a high proportion of librarian respondents (see 8.4.1).

For areas of external information, the pharmaceutical industry had the highest mean rating, with significantly higher scores for Legislation and Government policies. This reflects the close reliance on government support described by the Marketing Managerin Company B, who spoke of government control of pricing and industry sensitivity to government criticism. Significantly higher ratings were noted also for Technical information, and for Current affairs.

For sources of external information, overall ratings were again higher. The highest rating was given to Professional/trade journals, but scores were also significantly higher for External personal contacts, Own Library/information service, Government reports, Other libraries and Commercial databases. This preference for printed sources shows the strength of the library network, which was one of the industry's outstanding features.

All respondents had access to a library, with online databases and marketing information systems also more prevalent than in other industries. While libraries in other industries appear to be declining, growth continues in pharmaceutical companies. The Technical Change Centre (1983) found that this was the only industry to increase its information unit staff in the period 1977-83. Allen and Ward (1985) describe an increase in library support at Glaxo, which they attribute in part to growth in legislation and commercial influences. The Librarian in company A explained that the pharmaceutical division was the best supported of any division, with a library to support R & D and a separate commercial library (p94). The smaller pharmaceutical company in the case study (Company B) provided an example of the tension that can exist when an R & D funded library is approached by members of marketing and other departments:

> "The manager, Scientific information, to whom I report, is responsible for the provision of online retrieval services on a company-wide basis. Marketing liaise with our department regarding the supply of 'marketing' information, but our main purpose is to provide access to published information, almost exclusively scientific, in support of our Medical, Registration and R & D departments. Other departments rarely use our services and do not use us in any consultative capacity. We also provide an online literature search service for all our overseas (European) medical and marketing departments in support of our products. We have a centralised budget and do not charge out any of the costs incurred." (Librarian, small pharmaceutical company)

This trend away from purely technical to commercial information has been noted earlier (6.3.6) and is clearly having an effect on the structure of information services within the industry. Job titles in use (see Appendix VI) reflected this range of activities, from librarians within R & D to titles such as 'Business intelligence manager' or 'Technical and business information analyst'.

Differences of size were apparent in comparisons of the two pharmaceutical case studies. The large company was the largest user of online services in the country and was able to achieve economies of scale by central purchasing. The full range of external services was available, In the smaller company. there was a heavy concentration on bibliographic databases used for technical searching. Use of databases for business information was an extension of such use and there were no specific business services available.

From the survey results, although databases were widely used and highly valued, there was still much heavier emphasis on bibliographic databases for scientific and medical searching than on services providing general company information. This may be partly explained by the fact that a number of companies are US-owned. For example, in the small company (Company B), strategic planning issues were decided in the American head office,

so that general background information would need to be collected there rather than in this country (p105).

Much importance was attached to the information services provided by IMS. While other industries were benefiting to some extent from similar industry-specific services, IMS provided the most comprehensive range. Given the importance attached to external information in the industry, it is hardly surprising to find such a highly developed specialised service available.

The reasons for the extensive use of external information services in the pharmaceutical industry are varied. Because the industry's R & D investment has always placed a heavy reliance on libraries to supply the technical information to support research into new drugs, this has in some companies provided the right basis and degree of 'information awareness ' to develop the service beyond the technical area into business and commercial information. This change has come about both because of the increased importance of the wider environment to industry, but also because of the development of specialist business databases over the past few years. Because the libraries already existed, they provided the natural home for these services. In other industries, without this library framework, other strategies have had to be adopted.

Kefalas and Schoderbek (1973) in their research noted that managers in dynamic environments spend more time in acquiring external information than those in more stable environments. Roberts and Clarke (1988) similarly found that firms in stable environments made less use of external information, but that any uncertainty leads to greater information consciousness. The development of external information services in the industry points also then to factors in the industry itself. The pharmaceutical industry is, as Haygarth Jackson pointed out (see above) a high-risk and highly competitive industry and as such must place a high importance on external information.

8.2.2 Oil industry

There were 26 respondents from the oil industry, with fairly even distribution over the functional groups. The group had the second largest number of librarian respondents after the pharmaceutical industry. Replies were received from ten of the twelve companies contacted. The oil industry had the highest percentage of extensive users (22%) after pharmaceutical, with the highest recorded usage of financial databases (71%). Although in analysing use by department, use by the library was again high, there were an equal number of mentions from the marketing area and the library did not appear generally to have the central role which it occupied in the

pharmaceutical industry. However, almost all respondents had access to a library.

Areas considered most important in the oil industry were Competition and Market trends, which were important across all industries and also Acquisitions and Mergers. The Marketing Manager in the small company (Company D) explained that that there was always news of companies being taken over in the North Sea and this area was seen as an important one for gaining information (p122).

One questionnaire respondent commented on the unpredictability of the industry:

> 1) external information needs to be very current, decisions are made by the time anything is published
> 2) company services 100 clients from 20 offices so must be in daily contact with client demand
> 3) oil industry is difficult to predict activity due to sudden changes in local demand
> 4) would be interested in knowing more about the database world. Existing oil scouts publish news and views but usually too old by the time we get it.
> 5) not enough staff/systems capable of sifting for the useful data
> (Division engineer, small oil company)

As with the pharmaceutical industry, this volatile environment must contribute to the greater emphasis placed on external information.

This group had the highest score for Company personnel as a source. The Marketing Manager in Company D provided examples of how company contacts in the oil fields would

be used for confirming or denying rumours as soon as they appeared (p121).

As with the pharmaceutical case studies, there was a marked difference between the information service provided in the large oil company and that in the small. Differences in information provision by company size for questionnaire respondents were also apparent, from the respondent in the large company:

> "Literally hundreds of external online databases are available to us."
> (Market analyst, large oil company)

to the respondent in the small company who faced an entirely different situation:

> As you can see, this group of companies has barely progressed beyond the abacus!
> (Computer services manager, small oil company)

The large company provided an example of an information service which was combining internal and external information. The Marketing Manager in the small company felt that the industry had been slow to grasp such opportunities.

As with the pharmaceutical industry, most emphasis was placed on industry-specific information. For example, much of the work of the Information Unit in the large company was devoted to maintaining a specialist internal database (p111). In the small company, consultants were retained to provide specialist advice (p123).

8.2.3 Electronics industry

There were 23 respondents form the electronics industry. The highest number of respondents came from marketing and computer systems. This was the only group without a librarian respondent. Replies were received from ten of the twelve companies contacted. One large company declined to take part in the survey because of the confidential nature of the information:

> "IT has certainly eased our problems in a number of areas, but disclosure of our sources of information would or could indicate our commercial, financial and technical intentions which, you will appreciate, are confidential within the company."

A number of replies were received from the divisional rather than head-quarters level. This accounts for the high number of marketing managers, most of whom are based in divisions.

This group had the smallest percentage of medium and extensive users (39%). Apart from the external broker, no external information service was used 'often' by more than two respondents. This group also had the lowest number of mentions on the grid for external information use in departments. The greatest concentration of services was in finance (34%) and marketing (27%). The low number of mentions for library (3%) accords with the lack of librarian respondents. Only eleven respondents (48%) had access to libraries, compared to an average of 80%. As only three out of these eleven regarded the library as

'important' or 'very important', it can be assumed that libraries were not occupying a central role. In this situation, it is not surprising that electronics was the only industry group to rate libraries below 2 ('not important') as a source of information. Its highest rating was for Internal reports, suggesting a greater reliance on internal sources for external information. While the number of respondents with libraries was lower than for other groups, average numbers had access to other internal information services such as Management Information Systems (74%) or Marketing Information Systems (43%).

This industry group gave a significantly higher rating to Technological developments, reflecting its primary concern with this area. It was also the only group to rate Current affairs below 2, with 43% of respondents regarding this as 'not important'. This accords with its low ratings for libraries (Current affairs were significantly more important to librarian respondents) and low use of external information services (ratings for this area were higher among the medium and extensive user groups).

Availability of external information services was mainly at the functional level. This was illustrated by the case study marketing respondent who had experimented with the use of databases but had not found them satisfactory. He did, however, place a high value on

external information and in the absence of help from the company's computer system was maintaining his own manual collection of customer files (p147-8). A computer services administrator from a smaller company had also been trying unsuccessfully to promote database use.

This was in many ways the least satisfactory group of respondents. The lack of use of external information services was surprising in an industry which was concerned with the technology which was operating them. Gent (1987) also noted very low use of databases in her survey of reading habits of managers in the electronics industry. The answer may lie in the comparative youth of the industry, which has not given it time to develop the sort of information networks found in oil or pharmaceuticals. The case study respondents felt they were not typical of the industry as a whole as they were a 'strictly commercial organization' with all the development work being done in the European Head Office. Perhaps they were typical of the industry in placing the emphasis very strongly on the design of internal information systems and seeing the development of external information systems within their own companies as very much a secondary consideration.

8.2.4 Construction industry

This industry group had the lowest number of replies (15%), with only one librarian respondent. Replies were received from all but one of the twelve firms approached. From requests to receive a copy of the summary research report, this group appeared to be the least interested in the subject of this research project.

Five respondents (28%) were in the extensive user group, the librarian, a corporate planner and three finance staff. All finance respondents were either medium or extensive users. This importance of external information services to the finance area is confirmed by the information on the grid, which shows a heavy concentration of departmental use in finance departments. Use of Prestel and Ceefax/Oracle is high, 55% and 50% respectively of respondents reporting use, though none using it 'often'. This is higher than in other industries apart from pharmaceutical, but in spite of this the group's rating for videotex is the lowest of any. The other most heavily used services were the external broker and company information databases.

The number of respondents with access to internal information services was average. 83% of respondents had access to a library, a higher percentage than in the electronics or retail industries. Nine out of the 15 respondents who had libraries (60%) rated them as either

'important' or 'very important'. As noted above, however, there was only one librarian respondent. As in the electronics industry, use of external information services through the library appeared small, with only 6% of mentions on the grid. In some companies, libraries may be very small, as Johnston (1975) and Shoolbred (1987) have pointed out.

The case study respondent was probably typical of large firms in the industry in describing his library as providing purely technical information and using bibliographic databases only. In his company's case, the responsibility for promoting use of external information services rested not with the library but with the systems division (p134).

The area felt to be most important in this industry was Acquisitions and mergers, which received its highest score from this group. This rating fits with the greater use of company information and financial databases within finance departments. The case study respondent reported that his company was 'much involved with take-overs and mergers' (p134). This was also the only industry group to give a rating of over 3 ('very important') to Economic conditions, reflecting its particular vulnerability.

Ratings for sources of information were on average lower than for other groups, with no source rated above 3 and two (Commercial databases and Videotex) rated below 2

('not important'). The highest rating was for Company personnel.

Groeger (1974) acknowledges the lack of information-consciousness within the construction industry and Shoolbred (1987), in an intensive study of information use, points to a number of problems in information flow within the industry which cannot readily be solved by the application of Information Technology. He feels the new IT-based services will have a difficult job to compete with the traditional print or microfiche based services available in the industry. From the case study quoted above, it is apparent that changes to new ways of using information are not happening easily in the industry.

8.2.5 Retail industry

There were 24 respondents (20%) from the retail industry, with computer systems the largest group. Replies came from all but two of the companies (one medium and one small). There were three librarian respondents, two working within marketing departments.

Less than half the respondents were medium or extensive users of external information services. Whereas all librarian respondents were extensive users, all marketing respondents and all but two systems managers were in the non or limited user groups. Highest use by individual respondents was of financial databases and external broker (both 46%). No-one was using Prestel

often, and only two people Ceefax/Oracle, bibliographic and full-text databases. Grid information relating to company use showed a similar pattern, with highest percentage use of external broker, company information and financial databases.

The number of respondents with libraries (67%) was lower than in the construction industry, yet from the grid there was much heavier concentration of external information use in libraries than had appeared in either construction or electronics. Those respondents with libraries placed a high value on them, 12 out of 16 respondents rating them as 'important' or 'very important'.

This industry group had a significantly higher rating for Consumer attitudes and also the highest rating of any group for Demographic trends. Both show the obvious preoccupation of the retail industry with trends that will have a direct effect on future patterns of sales. An explanation of the way that demographic data is being used in one company is given by a questionnaire respondent:

> Our exploration of external sources of information such as viewdata and Telecom Gold is very much in its infancy. The company is more interested at present in scoring its accounts by the various demographic data available (Pinpoint, finpin, Acorn, TV regions etc) to enable mailshots etc to be placed for better response. That plus account behavioural scoring in order to control the amount of bad debt on the file is more important. (Senior systems analyst, medium retail company)

The case study repondent also felt that government policies and legislation were of increasing importance to the industry (p129), although these two areas did not rate highly on the questionnaire.

The retail industry as a whole is one of the fastest-growing parts of the whole service sector (Capital Planning Information, 1985). In an article which examines the specialist information services available, Grant notes the increasing competitiveness of the industry and the need to have current information to stay one step ahead of the competitors (Grant, 1987).

Need for current information was an aspect stressed in the case study interview with the Economic Information manager of the large retail company, whose department was subscribing to Press Association tapes so as to have news before it appeared in the newspapers (p130). Although the manager ackowledged that over the past few years her department's services had changed as a result of the introduction of information technology, changes had equally come about through external factors such as the increasing importance of government legislation and consumer awareness, and the company's own expansion and diversification in the period.

The Economic Information manager described her heavy use of the Profile database and particularly of Textline (see 7.2.4). She was also the only case study respondent

to be making good use of Ceefax/Oracle (see 6.3.12). In this case, a long established service had provided the framework for full advantage to be taken of new external information services.

With the importance of the marketing area within the retail industry, it is surprising not to find more examples of the type of use of Textline and other similar services noted with the case study company. Another large retail company was now acknowledging the need to set up a central information service:

> In a company of over 50,000 employees it is difficult to be in a position to give an overall view. My own experience embraces only a small number of HQ functional areas and while there is willing co-operation within divisions when particular information is required and sources are locally unknown, there is little structured in the way of a structured information service although this is likely to be developed.
> (Administration manager, large retail company)

The retail industry lacks the tradition of technical library use seen in the oil and pharmaceutical industries or even in construction, yet it does have an increasing need for wider information. This study suggests that information units are now developing particularly within marketing departments to meet the industry's needs.

8.3 COMPANY SIZE

Within each of the five industries, companies were selected equally from each of three groups divided by annual turnover: small (£43m-£99m), medium (£10m-£999m), large (over £1000m). Although questionnaires were sent to an equal number of managers within each of these three groups, the number of replies from the larger group was substantially higher, with 43% of respondents coming from large companies, 31% from medium and 25% from small.

Marketing and finance areas were particularly well represented in small companies (see Appendix V, Table A2), whereas over half the respondents from the librarian, computer systems and corporate planning groups came from large companies.

Aguilar (1967) noted that managers in large companies were more concerned with 'Broad issues' and 'Acquisition leads' and far less interested in the more short-range 'Market tidings ' and 'Technical tidings'. They had a wider interest in general information and because of this were more active in seeking it out.

In relation to use of external information services in this research, increase in use by company size was highly significant in the case of Prestel, bibliographic, company information and full-text databases. Increased use of Ceefax/Oracle and the external broker was also noted. As Table 15 shows, only 6% of respondents from small

companies were extensive users, compared to 26% from medium and 67% from large companies. Company size is therefore a very important variable in external information use.

There was also a marked increase according to company size in numbers of respondents with access to internal information services. While almost all respondents (96%) from large companies had libraries, these were available to only 61% of small companies. Similarly, only 58% had Management Information Systems compared to 87%. Online databases showed the most marked difference, with availability to only 10% of respondents from small companies and 58% of those in large.

In the context of a general lack of availability of both internal and external information services, overall lower ratings for both areas and sources of information are to be expected. Lower ratings for Current affairs in particular suggest a greater preoccupation with more immediate information needs in smaller firms, while the higher rating for Technical information in medium-sized firms shows a similar lack of broad emphasis within this group compared to the large companies.

Ratings for libraries and commercial databases were also significantly higher in the large companies which had greater access to these facilities. Two of the case study companies were small firms in the context of this

research. The small pharmaceutical and small oil company each had libraries and were using databases, so were not entirely typical of the small company group. Nevertheless, the difference in resources available to them and to the larger companies in the case study interviews were very apparent.

8.4 FUNCTIONAL GROUP

In this research, replies were sought from respondents in six functional groups; corporate planning, computer systems, librarian/information officer, finance, management services and marketing. The number of respondents from each is given in 3.4.3 and detailed analysis in Appendix V, Tables A1-A2. There was an even distribution of respondents among the librarian/ information officer, computer systems, finance and marketing groups, but a smaller number of respondents from corporate planning (14%) and management services (8%).

White and Wilson's study of manufacturing companies (1988) also looked at functional areas (production, sales, marketing, finance and personnel). They found that all these areas had some need for external information, though the need was greater in marketing than finance. Their results show few differences in the type of information need by functional group. Their interviews suggested information need for all managers was based more on the immediate problem than on functional role. Aguilar also

noted the extent of 'shared concern' for 'Market Tidings' among all types of manager (1967:61). Hambrick (1981) found no strong links between function and the total amount of time spent on scannning for information.

Aguilar's 'shared concern' was equally apparent in the results of this survey, with Competition and Market trends being the only areas to be rated at 3 or above ('important/very important') across all functional groups, apart from a slightly lower rating for Market trends from librarian respondents. Almost all groups put one or both of these areas in their top two places. Unlike ratings by industry, there were few significant differences for areas by functional group.

Sources of information, on the other hand, showed a number of significant differences. Most of these related to the higher value placed on libraries, databases and printed sources by librarian/information officer respondents. This group has a high regard for the sources which they use to provide a service to other managers in their companies. Company personnel were rated significantly more highly by finance and marketing groups, demonstrating the preference of both these groups for personal sources. A short description of survey and case study results relating to each functional group is given below.

8.4.1 Librarians/information officers

There were 22 librarians/information officers who responded to the questionnaire survey. Twelve were from the pharmaceutical industry, six from oil, three from retail and one from construction. The fact that the highest percentage of librarian respondents was from the pharmaceutical industry means that some caution is necessary in interpreting survey results as applying to librarian/information officers in general.

Eighteen of the 22 librarian respondents (82%) were extensive users of external information services, three (14%) were medium users and the remaining one (4%) was a limited user. Databases most in use were bibliographic (90%), full-text (90%) and company information (86%). Use of these three services was more likely to be 'often' than 'seldom'.

Both areas and sources of information received higher mean ratings from this functional group. Significantly higher ratings for Acquisitions and mergers, Current affairs and Technical information reflect perhaps the areas where most queries arise. Technical information represents the traditional role of the library, Current affairs and Acquisitions and mergers the newer areas in which a number of libraries/information units are now becoming involved.

Librarians/information officers gave the highest ratings to printed sources, libraries and databases. Their scores for Company personnel and Internal reports were lower. While appreciating the importance of External personal contacts, which was ranked first overall, the group put this item in seventh place after libraries and printed sources. This suggests that librarians might be under-estimating the value of the manager's personal network of contacts (see 6.3.2). Certainly, they are placing a higher value on their libraries than other functional groups would do. The highest mean score of any grouping in the survey was the rating of 3.68 given by librarians to 'Own library'. There is clearly a difference in perception which needs to be addressed in any consideration of the library's role in external information provision. As has been discussed in relation to industries (8.2) the library, according to grid information on the questionnaire, has a central role in the provision of information through external information services in the pharmaceutical industry and also in oil and retail, but was more peripheral in electronics and construction. The role of the library is discussed in 6.3.6.

8.4.2 Corporate planning

There were thirteen corporate planning respondents, one from electronics and three each from the other

industries. Over half came from large companies. The number of respondents in this category was disappointing. From grid information on the questionnaire, it would appear that 26 companies taking part in the survey had corporate planning departments which were using databases. In this case, the rate of response (50%) compares badly with the number of replies from named librarians (86%). In the pilot survey (see Appendix IV) with only one named contact from each firm, there had been a higher proportion of corporate planning respondents.

In addition to those within corporate planning departments, it should be noted that other respondents had a planning function. For example, job titles include strategic marketing manager, marketing services and planning manager, business development executive (sales and marketing) (see Appendix VI). These are examples of planning roles at the functional or unit, rather than corporate level and as such have been included in the analysis for the relevant departments .

Mintzberg sees the business analyst or corporate planner's role in this way:

> The analyst will no doubt conclude that many sources of information will remain open only to the manager - he has the status needed to tap them. But in a number of areas - information on technology, market trends, internal operation - the analyst can be of help. He can undertake a comprehensive search for other sources of this information, and he can put together a carefully designed monitoring system in these areas, one

> that not only covers more channels, but does much of the manager's scanning and filtering for him. (Mintzberg, 1973: 150)

Aguilar also saw a role for 'technical and professional specialists' to review external information and pass on relevant parts to top management (Aguilar, 1967: 74). With this sort of role, we should expect greater interest among this group for broader environmental information and greater use of the external information services which can provide it. Half the respondents in this group were in fact extensive users of external information services.

This group had the highest rating for Market trends, Legislation and Acquisitions and mergers and also for Economic conditions and Government policies. This demonstrates a wider concern for the broad environment than other functional groups. Like librarians/information officers, the highest value was placed on printed sources, while External personal contacts and Company personnel received fairly low ratings from this group. Their rating for Own library was second to *librarians themselves,* as was their rating for Commercial databases, though with a considerably lower mean score.

From case study evidence, this group were important users of library services. In Companies A and D, business development staff formed the largest and most demanding group of users (p101, 117). In the large oil company (Company C), much of the impetus for developing the

Information Unit to provide more business information had come from the setting up of a Competitor Group. This Group had also worked with the Information Unit on the development of the in-house competitor database and had been instrumental in promoting its use.

8.4.3 Management services

This was the smallest group of respondents, with only ten replies. Management services as a department did not appear to be making much use of external information services. Only 5% of total mentions on the grid were attributed to this group and seven out of ten individual respondents fell into the non- and limited user groups. The number of job titles (see Appendix VI) suggests that this was a more disparate group than other functions. Because of this and the small number of respondents, results were not analysed in detail.

8.4.4 Computer/systems

There were 22 respondents from the computer/systems area. Job titles (see Appendix VI) ranged from the more traditional DP manager to those who had a specific IT responsibility as PC support manager or IT planning controller or those with an 'information ' role as Information centre manager or Director, information services. Less than half the respondents (46%) were in the

medium or extensive user groups. Financial databases and Prestel were the most popular services used.

Three systems managers were interviewed for the case studies. In two cases, roles included a responsibility for external information. In Company C, the Head of the Information Unit had the specific task of looking at managers' information needs and was working with information systems staff and information scientists on the provision of both internal and external information (p114). The Information Systems Manager in Company G was responsible for increasing managers' awareness of information technology and with this brief he was encouraging the use of external information services, but without much success:

> "For the last 2-3 years, my colleagues and I have been trying to make management aware of and interested in external information, both online and on updated disk, but although some trials have been held, these have not been found to be of much practical use."
> (Systems manager, large construction company)

Another systems manager in the questionnaire survey reported a similar experience:

> On-line searching is very restricted and at present I am the only searcher. This trend seems as if it will continue until we see a general introduction to electronic mail etc. Whilst awareness is growing, the movement toward online information seeking is slow."
> (Computer services administrator, medium electronics company)

It is clear that the computer/systems function within companies is changing as the technology moves from large

central systems to smaller more dispersed provision. Detailed examination of this situation is beyond the scope of this research. The changing role of computing managers in relation to information use has been examined by Bentley (1980) and by Synott and Gruber (1981). The issue has importance in the consideration of external information services in that it provides an alternative route by which these services are promoted and used within the company. In this way, developments in computer technology can be said to mirror those on the library/ information unit side. While libraries are moving from providing purely technical information to a wider role in the provision of business information, so systems departments are moving from the maintenance of hardware to more of a helping role in managers' use of information. The systems role as thus defined may also include external information, as well as the internal information systems that have traditionally been the responsibility of the computing department. There is further discussion on the systems and information management approaches to information provision in 9.6.

As promoters of external information services, systems staff themselves have a poor record of use. From the grid information, computer systems had the lowest level of use (5%) of external information services. Where services were

being used, company information and full-text databases were the most popular with this group.

Ratings for sources of information were also lower than for other groups, with only External personal contacts rated at 3 or above ('important/very important') and three (Other libraries, Commercial databases and Videotex) rated below 2 ('not important'). Their rating of 2 for Own library/information service was the lowest of any group. Some writers looking from the library's point of view have seen the interest of information systems managers in external information provision as a threat (Aslib information, 1987). Promotion of external information services by systems managers alone does not seem to have met with success from the results of this research. Their lack of direct use of such services and low regard for information sources, including libraries and databases, may itself provide an explanation of this lack of success. The fact that the two examples in this research of such attempts to promote external services from a systems base come from the construction and electronics areas where library networks are not strong, is itself significant. The combination of librarians/ information officers with computing/systems staff noted in the large oil company may well be pointing the way ahead.

8.4.5 Marketing

There were 27 marketing respondents, with all industries represented, but the highest percentage (30%) came from the electronics industry. 56% of those replying to the questionnaire were from the non-use or limited use groups. This was surprising in view of the high departmental use by marketing which was highlighted in the analysis of the grid (see 7.2.3). From this survey, services most in use were external broker (21% of mentions) and company information databases (20%). The use of the external broker was confirmed by individual questionnaire replies, where marketing respondents were the most frequent users. Only between two and four respondents were using any other service 'often'.

Aguilar's research (1967) showed marketing executives very much concerned with the market area, which accounted for 81% of their responses in his interviews. He found them less concerned with strategic information and more with day to day issues, with much important information coming from customers. Similar results are noted by Keegan (1967), Kefalas and Schoderbek (1973) and White and Wilson (1988). Marketing managers in this survey showed similar preoccupations, rating only two areas, Competition and Market Trends at 3 or above ('important'/ 'very important'). They also had the highest rating of any group for Consumer attitudes and the lowest for Current

affairs. There was a strong preference for personal sources, with a significantly higher rating for Company personnel. An example of the use of company salesmen for market intelligence information was provided by the electronics company case study (p146).

Case study evidence suggests that marketing managers have industry-specific needs that will not necessarily be met by access to a wide range of databases. The three marketing managers interviewed all stressed the need for industry specific information and saw little use for general databases.

Piercy and Evans (1983) find little help in the marketing literature for developing information provision and propose a new structure which will incorporate a specialised information function. There was evidence from the questionnaire replies and the case studies that marketing information was indeed being given a high priority and often singled out for special treatment. There were separate marketing information units in Company B (p100) and Company E (p128). Several job titles (see Appendix VI) suggested a responsibility for information gathering, for example, market analyst, strategic marketing manager. There were also respondents in other functional groups who had links with marketing, for example marketing librarians in the retail industry. Two marketing respondents described their 'intelligence gathering' function in the following ways:

> "I have answered this questionnaire from the perspective of my department - the Marketing Intelligence department - which, though the broadest information gathering point is not the only one in the agency."
> (Marketing intelligence director, advertising agency, pilot survey)

and:

> "As the 'intelligence' gathering department for the company I am constantly looking for improved information sources. More use of online services may well be one of them."
> (Marketing services & planning manager, small oil company)

Respondents also mentioned the high cost of market research studies, but saw these as an essential means of getting external information (see p232).

8.4.6 Finance

There were 24 finance respondents, the highest percentage (28%) coming from the construction industry. 50% were extensive users of external information services and a further 25% medium users. This was a higher percentage than any functional group apart from librarians/information officers. Financial managers had the highest use of Ceefax/Oracle (62%), reflecting its use for ready access to share prices and other routine financial information. The largest number of respondents (67%) reported access to an external broker, who might well be providing indirect access to external information services (see 7.2.4).

62% were also using financial databases, showing wide but by no means universal take-up of these services. They

were frequently used in conjunction with company information databases (58%). This pattern is confirmed by the grid information showing company use, where the finance department emerges as the heaviest user, with particularly heavy use in electronics (34%) and construction (32%). Services most in use from the grid were financial databases (29%), external broker (22%) and company information (21%). Use of other external information services was very much lower.

Earlier research studies have shown finance managers more concerned with prescriptive information (Kefalas & Schoderbek, 1973, Keegan, 1967) and with internal control information (Roberts & Clarke, 1988; White & Wilson, 1988) Keegan has noted also the high use of outside services attributable to the information services provided by banks and brokers. White and Wilson note too the use of banks and auditing firms as 'the most regular sources of information' (1988: 13). Brokers and merchant banks are cited as a source of information by a number of questionnaire respondents (see p231).

Finance managers in the survey rated five areas at 3 or above (Competition, Market trends, Customers and suppliers and Acquisitions and mergers). Only two sources, External personal contacts and Company personnel were rated above 3, showing the preference for personal rather

rather than printed sources, which has already been discussed in 6.3.2.

In spite of their heavy use of databases, this group did not rate them quite as highly as did respondents from the librarian/information officer and corporate planning groups (see 6.3.11). One respondent described how financial databases and external contacts together met his information needs:

> "I can say that we do use Reuters systems extensively in the Treasury area. We find that this alone is able to satisfy our information needs when taken beside a continual flow of verbal information from a number of corporate banking relationships."
> (Group treasurer, large pharmaceutical company)

Most case study respondents mentioned the Finance department's use of databases, especially Dun & Bradstreet for credit checking. Finance managers were not included in the case studies, but information from other respondents suggests that this is an area where information sources are used within the department itself rather than through the library or information unit.

CHAPTER 9 PATTERNS OF USE: EXPLANATION AND DISCUSSION

9.1 INTRODUCTION

In the previous two chapters, survey and case study results were examined in relation to areas and sources of information and use of internal and external information services. Evidence of use/non-use of external information services was assessed and patterns of use identified in relation to type of industry, functional group and company size. In addition, the characteristics of users and non-users were identified. The first objective of this chapter is to examine the patterns of use and their causes as revealed by this research. The second objective is to analyse these findings with particular reference to different approaches to the use of information within company structures.

9.2 THE INFORMATION PROVIDERS' VIEW

As shown in the previous chapter (8.4.1), librarians and information officers formed a high proportion of the extensive user group, with 85% of this functional group using five or more external information services. Although, like other groups, they placed a low value on videotex services, their rating of commercial databases was significantly higher than for any other group.

This intensive library use of online services supports the finding of the Technical Change Centre report (1983) on the rapidly growing use of online services by libraries and information units (see 6.3.1). In the library literature, the main advantages of online access are seen as 'speed, accuracy and wide range of information' (Willis, 1986). Haygarth Jackson (1981) feels that the costs are more than justified by the saving in time and the competitive advantages. Cropley (1986) describes a library in the banking industry which has gone over entirely to online services.

All librarians and information officers in the case study interviews were using external information services and placed a high value on them. Most had access to a wide range of databases, ranging from bibliographic databases to support R & D in the pharmaceutical industry or technical staff in the oil industry, to full-text databases to support business development. Use of external databases was an integral and important part of the work of all libraries and information departments visited.

The future role of the librarian as intermediary as systems become more accessible to end-users has been discussed by several writers, including Houghton & Wisdom (1981), Moores (1981), Duckitt (1984), Norton (1985), Willis (1986), Nicholas (1987a) and Dutton (1989). Most

see more end-user involvement as inevitable as systems develop and services are increasingly targeted directly at the end-user market. Actual involvement is not yet widespread, however. Nicholas, Harris & Erbach describe 'end-user searching at a low level, but online searching flourishing' among librarians (1987c: 123) .

From the questionnaire returns and the case study interviews, it was apparent that most librarians and information officers in this study were encouraging more database searching by end-users, but that this was not yet widely accepted. Two questionnaire respondents described how they had attempted unsuccessfully to promote greater end-user involvement:

> "Take-up of these facilities after initial interest is slow because these people are very busy and many prefer to delegate information retrieval work."
> (Division librarian, large pharmaceutical company)

> "Probably not widely enough known within the corporate HQ here in spite of propaganda."
> (Information services manager, large pharmaceutical company)

In the case study companies, external database services were more likely to be used by specialist information staff, because of the costs involved and the time and expertise needed to select the correct database and carry out a successful search. The main exception to this was the full-text service Textline which was available in the library or information unit for direct use by managers in case study companies C, D and E (see p228).

9.3 THE INFORMATION USERS' VIEW

In contrast to the librarians and information officers who are the main group of 'information providers' within a company, the managers who comprise the 'information users', generally had a lower regard both for library services (6.3.6) and for commercial databases (6.3.11) . Apart from the finance area, where about half the respondents were extensive users and a quarter rated commercial databases as 'very important', there was little evidence of value being placed on online services, even though from the questionnaire returns and comments a number of respondents had had some experience of use. A similar situation was seen in the case study interviews, where no managers interviewed had much knowledge of databases or any interest in using a wide range of services, though there was evidence of value placed on specialised databases and of attempts to encourage use. Birks (1978) in a survey of fee-based information services noted problems in marketing general databases to managers. Tenopir (1985) similarly speaks of the difficulty of marketing electronic services directly to end-users who do not realise the need to use databases.

Financial databases have achieved more success with the 'end-user' market and real-time services are more likely to be found in finance departments than in libraries, although as demonstrated in 7.2.2 librarians

still form one of their main user groups. Successful use of real-time services by finance managers, however, does not appear to have led to wider knowledge and use of other online services. Eckersley and Rennie (1984) found that 16 out of 21 firms using Datastream had not heard of any other database service. This was similar to the case study respondent in the small oil company (Company D) who was making extensive use of real-time services but not aware of any other types of online database (p124).

9.4 REASONS FOR LACK OF USE BY MANAGERS

As the librarian in Company A pointed out (p96), managers with access to a good library service will not necessarily know or care whether the information they are given comes from computer or manual sources, as long as it is accurate and on time. Librarians can, therefore, be expected to place a higher value on the sources they use. As was seen in 6.3.6, however, many large companies do not have any central library provision and from the questionnaire results and the case study interviews, it was apparent that the company library was not always heavily used or properly exploited by the managers for whom the service was provided. If online services are of value as information sources, then we should expect this situation to be acknowledged by information users as well as information providers, in just the same way as Newspapers & periodicals or Professional/Trade journals

(6.3.7) are valued by all functional groups. The main reasons for low levels of use emerging from this research and evidenced by other research studies are lack of tradition of online use in some industries, lack of awareness, cost and pricing policy, complicated access, and irrelevance of content. (Martyn & Flowerdew, 1982: Harris, Nicholas & Erbach, 1986: Nicholas, Harris & Erbach, 1987a-c). These reasons are discussed below.

9.4.1 Lack of tradition of online use

Until the 1970s, online databases were used almost exclusively for scientific and technical information. Industries such as pharmaceuticals and oil were therefore early users of these external database services to support their R & D and technical departments. With libraries already established and staff experienced in search techniques, it appeared logical to house the new types of business database also in the library or information unit. This has led, as seen in 6.3.6, to more use of the library by corporate planning and marketing staff in addition to the traditional R & D and technical users.

Where the company has no such tradition of online use, different approaches are needed. These might come from the systems department, or from a central initiative or the initiative of individual managers. Different models of external information use are considered in 9.6. Whichever model the firm adopts, it is clear that acceptance of

database services will take longer than in those firms which already have a tradition of use.

9.4.2 Lack of awareness of external information services

One major reason why commercial online services have not been accepted as widely as might have been expected even in the larger companies on which this survey is based may simply be a lack of awareness of their existence and of what they can contribute to the managers' need for external information. Lester, Ettinger and Wootliff (1984) describe an attempt to introduce database searching as part of a management course. Roberts and Clarke (1987b) have drawn attention to the general lack of such information education in business and management schools. Lack of awareness of external information services has therefore to be seen as part of the much greater problem of general lack of information awareness and education among managers.

The fact that the use of external information services is greatest in companies which have an established library structure and therefore a higher degree of 'information consciousness' suggests that lack of awareness may indeed be a problem. A number of survey respondents wrote comments suggesting that these services were not widely enough known in their organizations:

> "An underutilised resource - generally due to a lack of knowledge of availability."
> (Divisional director, Business development, large retail company)

"Not as much use made as we would like, there appears to be a general lack of information on the data services available."
(Marketing manager, medium oil company)

"I would be interested in knowing more about the database world. Existing oil scouts publish news and views but this is usually too old by the time we get it."
(Division engineer, small oil company)

"In general, there is a fairly limited awareness of what products are on the market. People tend to stick to what they know-and that often doesn't amount to very much."
(Manager, credit management department, large oil company)

Attempts by librarians and information officers to promote use have been described in the previous section. Approaches by systems managers in two companies without central information provision have been described in 8.4.4.

One way of increasing awareness is through better marketing of the services by database producers. To some extent this is happening already, particularly as regards the direct marketing to end-users of services such as Textline (see p228).

Libraries and information units too have a contribution to make in increasing awareness. There were examples in the case studies of managers not being aware of the services available in their own libraries. Library use and database use will depend very much on attitudes to information within the company itself and on a company structure which will ensure that information services are

known to those that need them and are used effectively. This aspect is further discussed in 9.6.

9.4.3 Cost and pricing policy

An argument often put forward is that databases are too expensive in a society that has traditionally viewed information as free. Aylward (1982), for example, sees ignorance of the value of information as a major deterrent to wider use of electronic information services. The ITAP report (Information Technology Advisory Panel, 1983) has drawn attention to information as a tradeable commodity and though expense may be a convenient 'excuse' for a non-user, there are several examples that demonstrate the cost-effectiveness of online services compared to traditional library provision. This is easier to demonstrate when the company already places a value on information and has had a conventional library service; when starting from scratch the arguments need to be more forceful. Some writers (for example, Carter. 1981) have drawn up models to demonstrate the cost-benefit position of having information versus not having it, but such equations are difficult to sustain. General discussion of the subject of the economics of information will be found in Flowerdew and Whitehead (1974), Martyn and Flowerdew (1982) and Flowerdew, Oldman and Whitehead (1984).

While costing was a consideration in the use and control of external information databases, it did not

appear from this research to be a major factor in preventing the actual take-up of services. There was only one adverse questionnaire comment on cost:

> On-line access to data still appears expensive (eg as compared with microfiche). This may be due to the intermittent access which we require but heavy usage would be very expensive!
> (Director of manufacturing, medium electronics company)

Banks and brokers were widely used to provide information and would often be providing indirect access to online service, with costs charged back to the company concerned. Case study respondents indicated that they were prepared to pay large sums of money to market research agencies or to consultants to receive the information they needed (see p231). It would be surprising if, in these circumstances, large firms such as these would not be prepared to spend money on online services if they were convinced that the services were of value.

Rather than the actual costs, it appeared to be the method of charging used by most database producers that was inhibiting more widespread use. Most databases are charged according to the amount of time spent searching so that infrequent and inexperienced searchers can quickly run up unnecessarily large bills. With a service like Textline which allows unlimited use on payment of an annual subscription, more widespread use can be encouraged. This must account in part for the popularity of Textline with end-users (see p228). The large oil

company (Company C) had also found the database producers somewhat inflexible in their approach to new ways of using databases which combined external and internal data (p116).

The libraries and information units visited were all very conscious of costs and the question of charging back online searches and other information requests to individual departments was frequently the subject of debate. The regulation of cost was an important reason for introducing a degree of centralisation and control into database use. This was where the larger companies had the advantage of maximum discounts:

> "All external databases are paid for centrally at Head Office to obtain maximum discounts. Users are given passwords so that they can be charged back through the company's accounting system. Staff anywhere can approach a host in the first instance but eventually Head Office has to be brought in when payment becomes involved." (Librarian, large pharmaceutical company)

Cost might be a factor in encouraging managers to come to the library or information unit rather than search databases for themselves. In this way, costs will be met by the library itself rather than the department. At the same time, the use of library staff experienced in search techniques ensure charges are kept to a minimum.

If databases are to gain more acceptance by managers and be put to more widespread use then the costing system will need to be changed. The introduction of CD Rom services in place of online would radically affect the

payment system, but there appeared as yet to be little interest in this development. No information officer interviewed felt that use of any particular database could justify the expense.

9.4.4 Problems of access

Early databases were complicated in structure and command language and were seen very much as the province of the industrial librarian or information scientist who had been trained in online searching techniques. There were a number of host systems each with its own command language and a vast range of databases available that could potentially be of value in any information request. The information scientist therefore needed skills both in manipulating command languages and in identifying the most appropriate databases for a particular search. Constant practice was needed to keep the skills up-to-date. 'One-off' searching by end-users was not therefore encouraged and the information officers were almost universally used as 'intermediaries' in the search process.

Complicated access still remains a deterrent to end-user participation. The manager is likely only to need occasional access to a particular database and so is unlikely to be able to remember all the command structures that he will need. Nor will he necessarily know which of several possible sources will have the information he is looking for. A study at the pharmaceutical company, Glaxo

(Aslib information, 1986) found that encouraging end-users actually led to more demand for library staff to conduct searches as managers began to realise the full potential of the services available.

Bibliographic databases are unlikely to be used widely outside libraries because of their complicated structure and the number of databases available on any particular host. Financial databases, on the other hand, have long been accepted outside the library area, though studies suggest that users are not always exploiting the full potential of the services they have available (Eckersley & Rennie, 1984). Company information and full-text databases do not yet appear to have gained such widespread acceptance, though the success of Textline as a service with a simple structure aimed directly at the end-user market points the way to possible future trends.

In addition to complicated procedures, the problem of lack of access to terminals is another factor in managers' lack of use. This was seen as a problem, for example in the case study company B (p102). Greater availability of terminals is itself likely to lead to greater use.

In discussions with systems managers in the case studies concerning developments in internal databases, 'front-end' systems which made the systems easy for managers to manipulate and which often incorporated graphics facilities were seen as a high priority.

Similarly, database producers recognising problems of access have attempted to make their services more 'user-friendly' as they direct their marketing towards managers in addition to the librarians and information officers who have been their traditional users. Developments which combine internal and external information in a way that is both relevant to the manager and easy to access may well lead to wider use of online services in the future.

9.4.5 Content and relevance

Lack of use of external information databases may in fact not be due to lack of awareness, cost, or complicated access procedures. It may simply be that the type of information provided on these databases is either irrelevant or inappropriate to managers' information needs. While information providers place a high value on online services and the type of information they provide information users are less enthusiastic. Those respondents outside the librarian/information officer group who had tried to use these services had not in general found them satisfactory. One respondent was critical of database content and presentation:

> "The commercial databases on company/financial information tend to be disappointing. Major problems experienced to date are:
> 1. Poorly presented
> 2. Repetitious
> 3. Errors in financial information"
> (Corporate planning executive, large pharmaceutical company)

Criticism of commercial databases as being too general and not suited to the specialised needs of the particular industry is a recurring theme of the survey results and the case study interviews, as the following questionnaire comments show:

> "Generally, our areas of activity are too specialised to make much use of external information systems."
> (Group economist, Distribution & hotels company, pilot survey)

> "Also, as a headquarters unit, we do tend to deal much more on strategic issues which are not readily amenable to support from a 'narrow fact' database. eg 'how will this market look in two years or five years?'"
> (Director of manufacturing, medium electronics company)

Similar views were expressed in the case study interviews with marketing and systems managers. For example, in Companies F and G, databases were felt to be too general, of use only for general background information on customers or other companies in the industry (p136) or in the preliminary phase of a new project (p157).

While information providers comment on their currency compared to printed sources, to information users external information services may still not be current enough. For the Marketing Manager in the small oil company (Company D), the primary concern was for real-time information services with up-to-date industry prices and news rather than historic data (p124). In the large retail company (Company E), even though Textline was being heavily used,

its news was a week old and Press Association tapes were being bought in to ensure that the company was being kept right up to date (p130). In the large oil company, night staff were employed on a cuttings service to make the latest news available by the morning (p115).

Experience of database use had therefore led managers to conclude that they were of use only where general, background information was required. This type of information may not be considered relevant to the company:

> "As the UK product markets are not important for this company, there is very little interest for constantly updated sources of information - whether on UK consumers or UK companies. However, as the financial markets are very important for this company, there is heavy reliance on Reuters, Topic and Prestel."
> (Business development analyst, agricultural company)

or to the job of the particular department:

> "Our US parent may well buy into financial databases etc but we do not; it is not our job."
> (Marketing manager, small pharmaceutical company)

Industry-specific information was always preferred, whether from the trade press, from external personal contacts or from specialised information services:

> "Being in a fairly specialised industry, we tend to buy information from suppliers specialising in our industry."
> (Marketing manager, small pharmaceutical company)

> "The external information that is most important to us is the pharmaceutical market information produced by IMS International. This is relied on by marketing research and corporate communications."
> (Investor relations manager, large pharmaceutical company)

> "The databases that we have access to are used for general queries. Any detailed information about our own industry is best found through trade publications (and magazines) and market research" (Marketing and sales operations manager, large electronics company)

From the research results, therefore, it would appear that external information databases are at present only of marginal interest to those managers who have limited experience of using them. They see them as providing general information which may provide useful background, but for the industry-specific information on which they depend other sources are of more value to them. The next section looks at use of external information services in relation to the other sources used by managers.

9.5 MANAGERS' USE OF EXTERNAL INFORMATION

The lack of interest shown by managers in external information services would seem to be due to a combination of all the factors listed above. Costs, while not providing an explanation for lack of use, are inhibiting widespread adoption and so limiting awareness. Although there have been some changes in pricing structure and access which have benefited the end-user, complicated access procedures still make many systems appropriate only for the experienced searcher, which limits use especially in those companies with no library provision. Managers are not always aware of what is available, particularly if they are working in industries which do not have a tradition of library and information use. On the other

hand, those who have had some limited experience of the services tend to dismiss them as being too general and not as appropriate to their particular industry needs as the sources they are using already. This may be due to the content of the databases themselves, but it is also a reflection on the actual use of information by managers. Reluctance to use new sources of information may be due to a mistrust of information itself, as one questionnaire respondent suggests:

> "My own view is that too much external input blurs issues and inhibits innovative decisions."
> (Group marketing manager, small construction company)

Another respondent saw external information services as a threat:

> "Tried and tested methods, acquired over many years, are still used. My personal feeling is that online is seen as a threat in some quarters to career development and job security because it offers the ability to break into specialist areas."
> (Computer services administrator, medium electronics company)

Another likely reason is an innate conservatism among managers:

> "People tend to stick to what they know-and that often doesn't amount to very much."
> (Manager, Credit management department, large oil company)

Lack of education in the methods of information acquisition and use is another important contributory factor (see p275).

The importance to the manager of external personal contacts as a source of information has been amply demonstrated by the results of this research (see 6.3.4). Mintzberg, writing in 1973, pointed out that this preference for verbal communication had meant that technology had made little change to the manager's job:

> Indeed, except for his use of the telephone, the airplane and the dictation machine, it would appear the the manager of today is indistinguishable from his historical counterparts. He may seek different information, but he gets much of it in the same way - by word of mouth. Even the computer has apparently done little to alter the working methods of the general manager. (Mintzberg, 1973: 132-3)

Keegan, writing at the same time about information acquisition in multinational companies makes the same point in relation to international travel:

> We concluded that the most important media development in international environmental scanning is the jet aircraft and not electronic media. Travel is a major factor in environmental scanning and so far electronic media, including the telephone, are not. (Keegan, 1967: 162)

In more recent research, the Technical Change Centre (1983) saw the 'problem' of personal contacts and 'old boy networks' as an explanation of non-use of libraries and Nicholas, Harris & Erbach (1987c) identified the popularity of personal contacts in the City as one reason why databases are not much used.

Roberts and Clarke challenge the accepted view in the management literature that these personal networks provide an effective source of information:

> Mintzberg's information world is peopled by information primitives contentedly isolated from modern developments in information generation, manipulation and communication. (Roberts & Clarke, 1987:30)

and :

> Can it be claimed that large, multinational, companies are likely to succeed upon a supply of future-orientated information brought in from the external environment by managers on an informal basis alone? The proposition is manifestly absurd. (Roberts & Clarke, 1987:59)

It is difficult to agree with this criticism of the manager's personal network. As has been demonstrated earlier (6.3.4), external contacts will always be important, particularly at top management levels and some types of information will always be passed by word-of-mouth and not committed to paper or to computer database.

Mintzberg himself in fact sees a need for an 'in-between system' bridging the gap between the company's formal information system which mainly deals with internal information and the managers' own informal methods. (Mintzberg, 1973: 152). In view of developments in technology since Mintzberg's time, it is surprising to find in this research that informal methods of acquiring information are still so prevalent in large companies. In spite of the the importance now attaching to the firm's external environment, there is still little evidence of the type of systematic environmental scanning advocated by Aguilar over twenty years ago (2.3). Most information searching by managers in this study was on an ad hoc basis in response to immediate needs. There were few examples

of information units with responsibility for scanning the organization's environment.

There was a marked difference between the attitudes and values of information users and information providers taking part in this research, illustrated by a number of different approaches to information use. In the rest of this chapter, these different approaches are explored in relation to company structure.

9.6 APPROACHES TO INFORMATION USE

9.6.1 Influence of company structure

External information use is affected by the structure of the company. The degree of centralisation, for example, will influence the way information services are handled, as some questionnaire respondents pointed out:

> "[The company] is too large and departmentalised for any single person to respond to this questionnaire adequately."
> (Planning manager, large pharmaceutical company)

> "While I provide central services...we are a de-centralised group. Consequently, there will be actual and potential applications of which I am unaware."
> (Systems manager, large construction company)

In a study of the role of the corporate centre in managing diversified companies, Goold and Campbell show that while information technology has made it easier for the centre to have access to business information, 'open information flow depends more on attitudes and people than on the technicalities of the information system' (1987: 303-4).

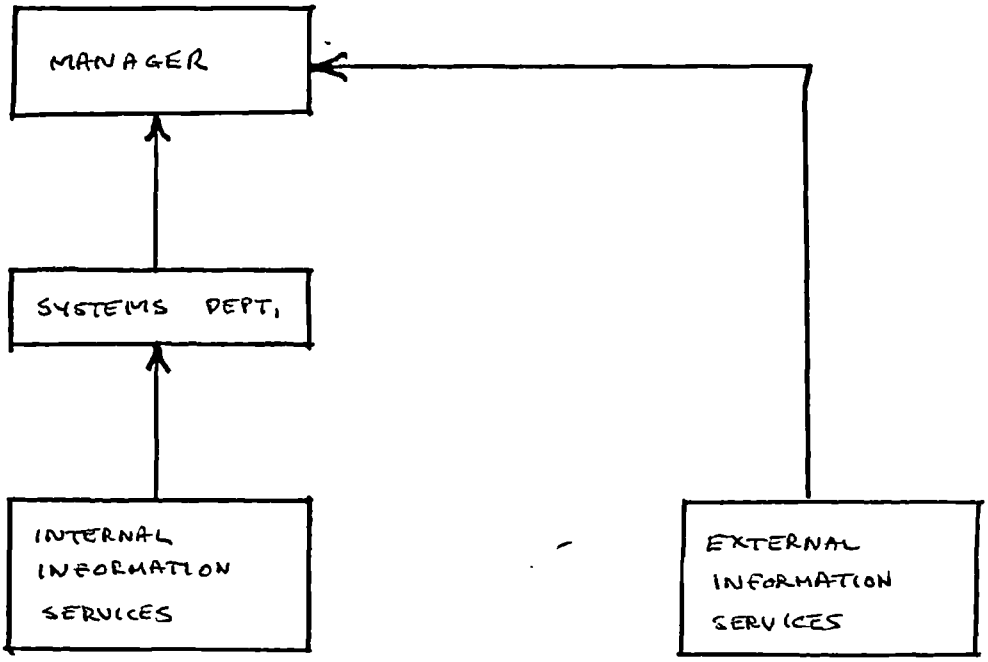
Communication thus remains a crucial factor in external information use, ensuring that information collected within company departments reaches those who are making the decisions and has a role in strategic planning (Aguilar, 1967: 184, 190. Fahey & King, 1977: 62. Pfeffer & Salancik, 1978: 270). The success of an environmental scanning system (see 2.3) rests on its relationship with the company structure and its corporate decision-making processes (Jain, 1984: 127).

From this research, it is clear that a number of departments have their own specialised information units. These are especially prevalent in the marketing area (8.4.5). Instances of managers not being aware of the services available in libraries and other information units within their organizations were also apparent in this study (6.3.6).

While a large number of factors are involved in the way external information is used within a company, a study of the case study interviews revealed four basic approaches to information use. They are the individual approach, the library approach, the systems approach and the information management approach. These four approaches are discussed below and illustrated in figures 8-11 (p291, 297).

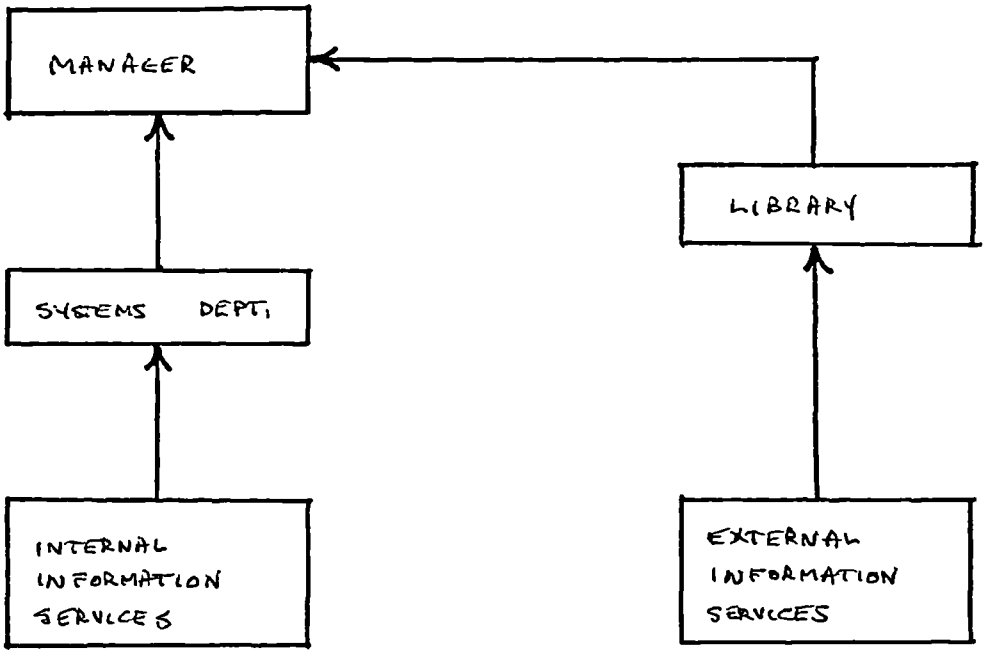
1. Individual approach

Fig. 8



2. Library approach

Fig. 9



9.6.2 Individual approach

In this approach, the structure makes it necessary for each manager to be responsible for his own external information needs. As figure 8 shows, internal information is available to the manager through the company's internal information system, but with no central provision of external information, the manager must devise his own systems. This was the approach used in Company G (see figure 7), where there was no central information service. Internal information was available through the firm's computer system, but for the external information he needed for his job, the Marketing Manager was relying on his own contacts and also on the system he had devised for himself for maintaining files on customers from national and trade press cuttings (p147-8). Although he felt this system worked well and gave him all the information he needed, it did seem surprisingly primitive in an electronics company which prided itself on the sophistication of its internal information computer systems.

This case study respondent represented the 'typical' manager in Mintzberg's study, using his own informal methods of acquiring external information because the company's formal system was failing to provide him with the external information he needed (see 7.1.2).

From questionnaire comments, the individual approach was common. In one oil company, departments were individually responsible for commercial database use, even though library services were provided centrally:

> "The company as a whole has organised in two ways around the provision of external information services:
> 1. Traditional sources - newspapers, trade press, reports etc. have been organised centrally by the library function.
> 2. IT sources - public online databases have been taken up on a highly fragmented basis by different functional areas, although the library can offer advice and expertise."
> (PC support manager, large oil company)

Another respondent describes a similar approach:

> "The use of external information sources is at present unco-ordinated within this organization, as user areas prefer to work systems independently, provided the information service provides some end value."
> (Publications and Administration manager, medium pharmaceutical company)

The use of words like 'fragmented' and 'unco-ordinated' in these descriptions suggests that respondents were not generally happy with the approach. In a further case, duplication of effort was acknowledged as a problem:

> "In general, external information seeking is done by individuals within their own work areas. This does result in an element of duplication of effort."
> (Computer services administrator, medium electronics company)

A respondent from a large retail company suggests that informal co-operation was no longer working satisfactorily and there was a need to adopt a more structured approach:

> "While there is willing co-operation within divisions when particular information is required and sources are locally unknown, there is little structured in the way of a structured information service although this is likely to be developed." (Administration manager, large retail company)

The individual, informal approach to external information appears therefore still to be widespread, in spite of a recognition that it is in many ways unsatisfactory, leading either to duplication of effort at the one extreme or missing of important information at the other.

9.6.3 Library approach

Companies A, B and D in the case studies (figures 1,2 and 4) provide examples of this approach (figure 9). Companies A and D were now providing more extensive services to corporate planning staff than to other groups, while in Company D there was still a tension between its original role in support of R & D and the newer demands being made on the library service by other departments.

As has been shown earlier (6.3.6), the traditional library service which was already providing access to scientific and technical online services has often been seen as the logical home of the newer types of database service. In this situation, as figure 9 shows, the manager continues to receive internal information from the company's own systems department, but for external information he has access to a company library.

With the library approach, there is generally central control of book and journal purchasing and often of online services too. This gives the library an administrative role, which may be enhanced by its responsibility for filing and company archives, as in Company D (p117) or for the maintenance of product files as in Company B (p101). Because of its role in ordering and storing books, users may tend to see its role as essentially an administrative one, or as a place to go and consult books and journals rather than to seek out information. This was the view of the library held by the marketing managers in companies B and D, whose own approach to external information was very much on an individual basis, as they made little use of the library and its database facilities.

The libraries for their part may tend to take a passive role, responding to information requests rather than initiating. While libraries are clearly providing a valuable service to some managers, the librarians interviewed acknowledged that there were some individual managers and some departments who were not using their services. The problem of non-use is discussed more fully in 6.3.6.

The sort of service a library will provide will depend very much on its place in the company structure and on the level of support it receives from top management levels. As a source of external information for managers, the

library can serve an important yet only partial role. In the library approach, there are no links between the company's internal information systems and external information provision, so that opportunities to combine internal and external information in one company system will not readily arise.

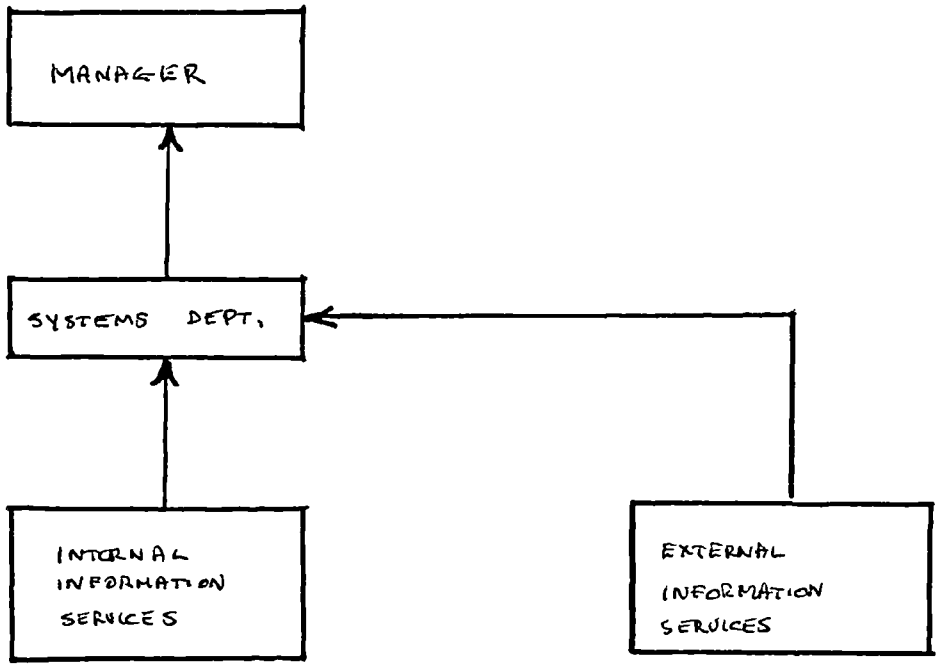
9.6.4 Systems approach

When a company has no central information provision, it is likely that some other part of the company or some individual will take on the information role. Because of its links with the development of internal information systems and its familiarity with the technology, this role may well fall to the systems manager. With this approach, as shown in figure 10, the systems department takes on responsibility for the provision of both internal and external information services.

This approach (figure 10) was found in Company F (figure 6), where the Systems Manager had been given responsibility for increasing managers' awareness of IT services. As part of this role, he had been trying to encourage greater use of online services and had identified some possible uses which he was trying to persuade managers to adopt. Like other systems managers who had reported similar attempts in the questionnaire survey (see 8.4.4) he had met with little success. Not only did he need to convince individual managers of the

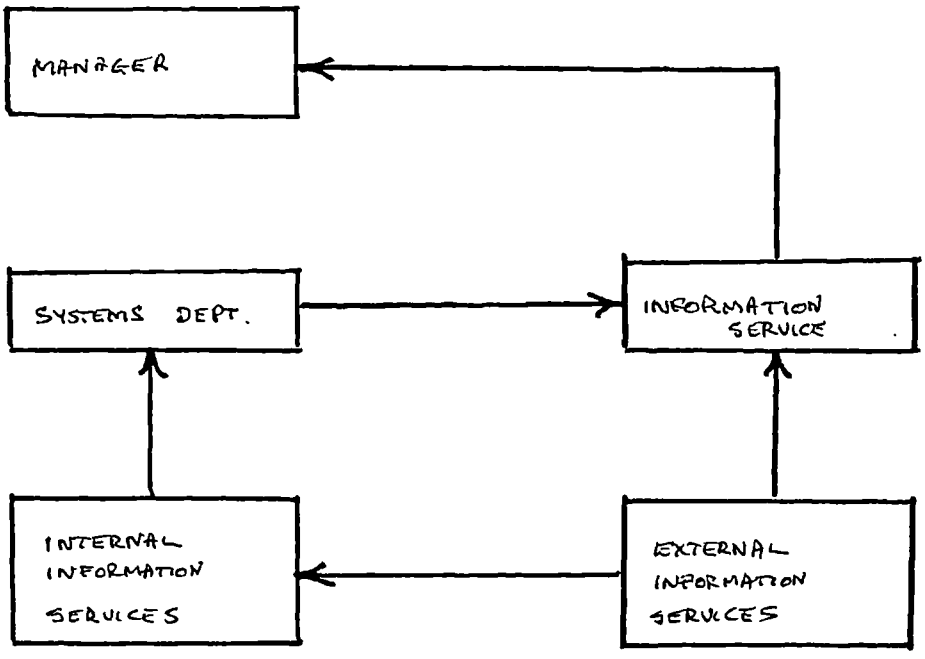
3. Systems approach

Fig. 10



4. Information management approach

Fig. 11



value of databases, he also needed to convince top management to support his work. In this he was an example of the 'enthusiastic amateur' described by Vickers (1984a) who went about his task without real company backing.

With the decentralisation of computer systems, the role of systems managers in companies is changing. Synott and Gruber (1981) see a wider information role as a logical extension of the information systems manager's traditional job. At first sight, there would seem to be advantages in the systems approach in that it combines responsibility for both internal and external information in one department. The major disadvantage is that systems managers do not generally have need for external information in their own jobs and so have little knowledge of the sources available. This was shown in this research by their low ratings for sources of information compared to other groups (see 8.4.4). In contrast to the library approach, which will start from the information need and then identify the source, the systems approach will start with the technology and look for applications.

9.6.5 Information management approach

The fourth approach (figure 11) is the integrated information management approach. This was seen in Companies C (figure 3) and E (figure 5). Company E was providing a specialised information service for top management. In Company C, a general business information

service for managers had developed from a scientific and technical base. This service is used here as the model for the information approach.

With this approach, the company has an information service which works in close co-operation with the systems department providing the manager with both internal and external information from a variety of sources. Research has shown that managers are more interested in information than in library services (see 6.3.6) and an information service is more likely to be regarded in a positive light. The information department in Company C had the additional advantage over other types of information service in that it combined the expertise of information systems staff with those of information scientists. It thus had staff working together who understood the technology and who were familiar with external information sources. The Head of the Unit had been given the specific task of looking at managers' information needs. Unlike the Systems Manager in Company F, he did not have to begin by convincing top management of the value of using databases because their use was already well established within the information unit.

This team was currently working on the development of databases which would combine both internal and external information in a form that was accessible to managers at their own desk-top terminals. In planning this new system

and also with their database of competitor information, the unit was working closely with other departments, so as to ensure that it was responsive to user needs.

The information approach as exemplified by Company C offers many advantages over the other approaches. It combines responsibility for internal and external information, it offers a responsive information service to managers and it provides the right framework for the development of new systems. This approach comes nearest to the concept of information management advocated by Vickers (1984c), who shows that the most advanced examples of good information management practice come from larger companies such as the case study company here described.

9.6.6 Review of the four approaches

1. The most common approach to external information by managers in larger companies is still based on individual responsibility for gaining access to appropriate information sources. Many managers will prefer to use this direct approach even when the company has its own library service.

2. The company library is an important user of electronic external information services and is expanding its role beyond the traditional scientific and technical side. A number of managers, however, are failing to make full use

of its services and remain unaware of the information sources available to them.

3. In some companies, the systems manager has been active in the promotion of external information services in addition to his primary responsibility for internal information. This has often happened on an ad hoc basis according to the interests of a particular manager. Such efforts have not in general been successful, due to failure to understand managers' information needs, generally combined with lack of top management support.

4. The information management approach combines responsibility for internal and external information in one department. This has the advantage that it can draw on the complementary skills of systems staff and information scientists. In this environment, database developments which integrate external and internal information will be encouraged. With a company information policy and a company structure that supports such an approach, more structured use of external information by managers is likely to result.

CHAPTER 10 CONCLUSIONS AND SUMMARY OF RESEARCH

10.1 REVIEW OF THE RESEARCH

This research has looked at the use of electronic information services both by managers and by librarians/ information officers within the context of the manager's general use of external information and the value placed on various information sources. It therefore contributes to the user studies on which future systems developments must be based.

Previous studies have looked at smaller companies which were making minimal use of electronic information services, or have looked specifically at users of a particular kind of database. Evidence presented in this study on the extent of use of external information services by both librarians and managers therefore represents a first attempt to describe patterns of use of these services by managers in larger industrial companies.

Any development of external information services needs to take account of exactly what information managers want and by what methods they prefer to acquire it. The perceptions of information specialists on the value of information sources may well be at variance with the views of managers. For this reason, both the views of

information users and information providers are examined in this study.

Use or non-use of electronic services will depend on a variety of factors which relate to the suitability of the services themselves, to the manager's level of information-awareness and to the actual information management structure within the organization. These various aspects have also been considered in this study.

A problem encountered in research in a developing area such as this, is that changes are taking place during the period of the study. Some changes noted between the questionnaire survey carried out in May-June 1987 and the case study interviews in April-June 1989 are included in the text. No systematic attempt has been made to compare findings over the period, but it is suggested that changes in managers' approaches to external information have in general been little affected by developments in technology. More long-term research would be needed to substantiate this point and to chart the development of formal information management structures within organizations.

Although the particular interest of the research was to find the value which managers placed on electronic information services, the findings also build on previous research to provide a more general picture of managers' use of external information, including the role of the

company library and the personal communications network. The major findings of the research study are summarised in the following sections.

10.2 AREAS OF EXTERNAL INFORMATION

10.2.1 This research shows the importance which managers attach to external information, especially that relating to market trends and the activities of competitors. The emphasis on the market across all industries and all functional groups confirms the findings of earlier research, but brings out particularly strongly the manager's interest in 'industry-specific' information. The type of industry is in fact a more important variable than either the size of the company or the manager's own functional role in determining both the general level of importance attached to external information and the particular areas considered of most interest.

10.2.2 There is a comparative lack of interest in the organization's broader environment which again follows earlier findings. There does, however, appear to be growing awareness in larger companies of the importance of the wider economic and political climate. The social environment is generally regarded as of much less importance, in spite of the influence that current affairs and demographic trends are likely to have on the organization's long-term plans.

10.2.3 A higher level of awareness of the importance of current affairs is shown, not unexpectedly, by librarians/ information officers and by those managers who are themselves using a range of electronic information services.

10.2.4 Managers in general do not see it as their responsibility to collect information which does not relate to their immediate needs. Information is sought rather in response to specific demands than to long-term plans. The collection and dissemination of external environmental information should therefore be seen as an organizational responsibility and not left to individual managers or departments.

10.3 SOURCES OF EXTERNAL INFORMATION

10.3.1 Managers have a clear idea of the information they need in their particular area and the sources they would use. It is clear from examples in the case studies, however, that information on areas outside their normal interests is more difficult to obtain, as they do not have the same familiarity with the appropriate sources.

10.3.2 The study confirms the importance of the manager's personal communications network. Managers at all levels are active in building up their own networks of people they can contact for information. For marketing managers, company salesmen are seen as a vital source of information on competitors. External contacts are of greater

importance for other groups. Such links are of particular importance at top management levels, where the contacts are with persons of influence in the political or business world. Personal contacts are equally important in this study to managers using a range of electronic information services and to those who are using none. Managers rely on personal contacts for obtaining up-to-date information quickly and 'off-the record'. Because of issues of confidentiality, external information in competitor areas can rarely be gleaned from other sources. In addition, the latest information will always be more accessible through personal contact than through print or database sources.

10.3.3 Librarians/information officers place less emphasis than managers on personal sources. There is a tendency for those working in the library/information area to see the informal 'old boy network' as a threat to the more widespread use of libraries and electronic information services. It is important, however, for librarians to recognise the personal network as an essential part of the manager's repertory of information sources and one that is unlikely to lose its prominence even with more widespread use of electronic services.

10.3.4 Printed sources, and particularly trade publications, come next in importance for managers after personal contacts. In stressing the importance of the

personal network, previous management research has tended to overlook the fact that publications are of almost equal importance to many managers. From the evidence of this study, managers are regularly looking to certain trade publications for up-to-date industry news, as well as more routinely scanning a range of journals and newspapers for background information on the industry.

10.3.5 Keeping informed of developments in the industry is also an important consideration for managers and the provision of up-to-date information is vital. Certain companies are providing extensive press cuttings services to give their managers current industry digests. In others, the collection of such information is left to individuals.

10.4 COMPANY LIBRARIES/ INFORMATION UNITS

10.4.1 This study reveals that, even within the larger companies which make up this survey population, company libraries/information units are by no means universal and that those that do exist vary widely in scope and in the range of services that they offer to the manager. In the survey, 20% of managers have no access at all to a library service and for others library services are limited. Access to a library depends very much on the type of industry and the size of company, with provision least likely for managers in the electronics industry and in

the smaller companies (annual turnover £43-99 million) in the terms of this research.

10.4.2 In companies with established library structures, the trend is away from the traditional scientific and technical information service towards a broader provision of management information to a wider range of departments within the company. Libraries/information units at varying stages in this development process were encountered in the research study. The most highly developed services are in the largest companies, but even here librarians report problems of lack of use by managers in some departments. Patterns of use depend on the place of the library in the company structure and the resources made available to it, but also on the interest of the librarian in promoting the service more widely. Information units with more specific objectives to serve the information needs of managers are more valued than the more traditional library services which have a range of administrative functions.

10.4.3 Corporate planning or business development staff in particular are now making greater use of company libraries, in addition to the traditional R & D customers. The departments which the library/information units in the case studies serve depend both on the place of the library in the company structure and on the degree of proactivity. It would appear that, in general, finance and marketing departments are more likely to develop their own

information units than make use of a general company library for their specialised information needs.

10.4.4 There is evidence that industries which do not have an R & D background are now recognising the need to develop information services so that they may take advantage of the range of electronic sources available. In this research, the retail industry in particular provides examples of information units being developed within marketing departments.

10.4.5 Librarians/information officers, with few exceptions, see their own units as the most important source of external information for the organization. Managers, on the other hand, do not generally rate libraries as very important. This difference in perception, noted also in relation to the managers' preference for personal sources, is an important element in the study of external information use. In the librarians' perception, lack of use is due to the manager's lack of awareness of the services the library has to offer, to be solved perhaps by better promotion and marketing efforts. On the other hand, it can equally be argued that it is the librarian/information officer who must be more aware of the managers' information needs in order to provide a more responsive and targetted service. Case study interviews with both managers and librarians

suggest that there is work to be done on both sides to increase levels of awareness and understanding of needs.

10.5 ELECTRONIC INFORMATION SERVICES - EVIDENCE OF USE

10.5.1 While both Prestel and Ceefax/Oracle are available on a fairly wide scale, particularly in larger companies, examples of constructive use are rare. For the most part, these services are used only infrequently and are given low ratings by their users and non-users alike. Very little value is therefore placed on videotex services for external information.

10.5.2 Like videotex, online commercial databases receive a low overall rating from respondents in this study. Unlike videotex, however, their main users value them highly as an information source.

10.5.3 Extensive use of electronic information services is very much dependent on the type of industry, the function of the respondent and the size of company. Outside the largest companies, and particularly outside the pharmaceutical and oil industries, use of electronic external information services is sporadic. The majority of heavy users are librarians/information officers, with finance managers the other main user group. Little use is being made of these services in the smaller companies.

10.5.4 The vast majority of librarians within the larger companies in this survey are making extensive use of

online commercial databases and place a high value on them as an information source. Many queries from managers are answered routinely from online databases, which have become an accepted and valued part of the library's repertory of information sources.

10.5.5 There is a strong link between use of external databases and availability of a company library/ information unit. External database use is most frequent in the pharmaceutical industry and in the larger oil companies which have established library networks. There are no examples in this study of managers who are making extensive use of electronic information services who do not also have access to a company library .

10.5.6 Much commercial database use is directly controlled by the company library for reasons of convenience and cost. Some librarians are actively promoting end-user searching, but take-up by managers has been slow. There is a feeling that managers prefer to leave searching to the library staff who have the expertise, or that they are insufficiently familiar with the range of services available to use them effectively.

10.5.7 The most commonly used external information service is the information broker, popular alike with those who have access to a range of in-house services and those who do not. This need to use outside experts is reinforced by descriptions of the use of market research

agencies and consultants in the case study companies and also by the use of banks and brokers by finance managers in the questionnaire survey.

10.5.8 After the information broker, financial and company information databases are the most popular overall. The older-established bibliographical databases remain the most used service for librarians/information officers.

10.5.9 Full-text databases emerge from the questionnaire survey as the least used type of service. The frequent mention of Textline in the case study companies, however, suggests that this particular full-text service has increased its market share in the two years since the questionnaire survey was completed and is now the service most popular with end-users. This can be compared with the high value which managers place on newspapers and other printed sources on which the Textline service itself is based.

10.5.10 Finance, marketing and corporate planning departments and libraries are the main users of external information services. The pharmaceutical industry demonstrates the greatest concentration of use controlled through the library. From the case study interviews, it would appear that finance and marketing departments are more likely to set up their own information services, but there were several examples of corporate planning or

business development departments working in close liaison with library services.

10.6 ELECTRONIC INFORMATION SERVICES - REASONS FOR LACK OF USE

10.6.1 While electronic services have clearly had an impact on the development of company library and information services, their use within industries which do not have established library networks remains small. Even where libraries exist, managers are often failing to take full advantage of the range of services, including electronic services, available to them. With the high rating accorded to them by their main users, it is logical to ask why use of commercial databases is not more widespread and why they are not valued as highly by managers as are, for example, trade journals and newspapers.

10.6.2 From the evidence of this research, the major reason for lack of use given by managers is that the actual content of the commercial database services is not considered relevant to their needs. Where managers' interests are in industry-specific market information, databases are seen to be providing more general background information. Their role is therefore seen as a minor one, unlikely ever to replace personal contacts and trade publications as the main sources of information.

10.6.3 Behind the managers' comments on lack of relevance can also be detected a conservatism and a preference for known sources. Lack of awareness of the range of services available is acknowledged by several managers as a contributory factor in their lack of use. This is particularly the case in companies without a library structure.

10.6.4 As managers are prepared to spend heavily on market research reports and consultancy services to get the information they require, the actual cost of database services is not seen as a reason for lack of use, although the pricing structure of many services is not designed to encourage widespread use among managers who are not experienced in search techniques.

10.6.5 Complicated access procedures and indeed access to terminals themselves are seen as diminishing problems as systems become more 'user-friendly' and more widely available. It is unlikely, however, that individual managers will have either the time or the inclination to master a wide range of external databases; they would see this, quite rightly, as 'not their job'. Access is likely to be confined to those services which managers use regularly in the course of their work.

10.6.6 If database services are to become more widely accepted and used, they will need to be more specifically targetted at the managers' information needs. Competitor

information provides one example of a discrete area where databases could effectively be developed as a substitute for press cuttings services or the personal files kept by individual managers.

10.7 INTERNAL INFORMATION SERVICES

10.7.1 Although this research has not been concerned in detail with the internal information services in the companies studied, it was considered appropriate to gather data on the availability of Management Information Systems, private viewdata and other internal systems in order to compare patterns of use and to look for correlation between external and internal information services that often used the same technology.

10.7.2 As with external information services, the availability of internal systems increased noticeably with the size of the company, but there were fewer significant differences by type of industry.

10.7.3 Developments in internal information systems appear to have advanced much more rapidly than those dealing with external information. For example, over 60% of those respondents in the survey who have no access to any external information service, report access to an internal Management Information System within their company.

10.7.4 While internal information systems have a vital role to play in providing control information to assist in the internal management of the company, their use to the manager is more limited. As managers have more need for external information for their strategic planning roles, they may well ignore the formal system and often develop rudimentary systems of their own to make up for this lack.

10.7.5 There are indications that systems managers are aware of the difficulty which senior managers may have in identifying important trends from the mass of data which the company's computer system produces. This has led to the development of 'front-end' systems and graphics facilities which make the systems more immediately accessible to managers. It is still rare to find examples of company systems which include both internal and external data, but there are indications that such systems are now being developed.

10.7.6 Managers who are using a technology for an internal information service are not necessarily using the equivalent commercially available service. There are several managers who use private viewdata, for example, but do not use Prestel. Only in the case of the online database for company information was there a significant correlation with extent of external information use. This was highlighted in the case study companies, where examples were seen of firms that were compiling private

online databases of company or competitor information from both internal and external sources. Such developments may well encourage managers to make greater use of electronic services for external information in the future.

10.8 EXTERNAL INFORMATION AND COMPANY STRUCTURE

10.8.1 One of the significant findings of this research is the fact that even within the large organizations with which this study is concerned, patterns of use of external information services are still very much dependent on the type of industry and on the size of company. Company structure to a large extent determines the way in which external information is organized and disseminated.

10.8.2 This research has identified four different models of external information use, which are summarised below.

a) Individual approach.

In this model, individual managers take the initiative in developing their own methods of acquiring external information, whether or not the company has an established library or information structure.

b) Library approach

Here managers are supported by a company library which may be specifically designed to provide them with external information, or may have as its prime function the

provision of scientific or technical rather than management information.

c) Systems approach

In the systems approach, the provision of external information is seen as the responsibility of the computing or systems department which is also concerned with the company's internal information system.

d) Information management approach

This approach combines the expertise of computing and information specialist staff in one department which is responsible for both internal and external information systems.

10.8.3 The individual approach is the most frequently encountered among managers in the research study, even where the organization has its own library or information unit. Whatever technological developments are available, managers will still need to cultivate their own personal information sources. A total reliance on this informal approach, however, may result in managers duplicating effort in conducting their own information searching, or at the other extreme, missing vital information because no-one has the responsibility for collecting it. The manager needs to be supported by a formal company information structure which will ensure that he gets the right information at the right time.

10.8.4. In the library approach, the library is seen by managers as one of a range of sources of external information available to them. Where companies have an established library structure, the development of business databases has been an important factor in the extension of libraries into the provision of management information, but take-up and use of company library services remains patchy. Use by managers will depend on their own past experience of the use of libraries and their own interest in acquiring external information, as well as on the success of the librarian/information officer in developing and promoting services. The department in which the library is based within the organization and the extent of support it receives are also important factors in the way it will be used by managers.

10.8.5 The systems approach reflects changes taking place in computing departments, which, like libraries and information units, are having to adapt to changes in technology which have made information more readily available directly to managers through desk-top terminals rather than central data processing facilities. While the systems approach offers the potential advantage of exploring technological developments which will combine internal and external information, an approach which is based on systems and technology rather than on an

understanding of external information needs is unlikely to find support from managers.

Examples in this study of attempts by systems managers to promote use of databases have largely been unsuccessful. While systems managers tend to blame this on the unsuitability of the services themselves, another likely reason is their own lack of understanding of the managers' information needs. Examples of the systems approach identified in this research also suffer from their origin in the personal initiative of an individual manager rather than as a result of a deliberate company information policy. Any method, to be successful, needs top level company backing.

10.8.6 The information management approach has obvious advantages in that it combines the expertise of computing and information specialist staff and points the way to the development of systems which will combine internal and external information in the most appropriate form to meet the manager's information needs. Such an approach implies changes in the structure of the company in order to accommodate it. Its implementation would require the company first to identify managers' needs and then establish a company policy and an appropriate information structure.

Very few examples of this 'textbook' model are found in the research study. There are indications, however,

that managers are aware of the need for a more structured approach to avoid the duplication and possible information gaps which are inherent in the more informal approaches which are still prevalent even in the large companies taking part in this study. It is only through such developments that use of electronic information services is likely to become an integral part of the process of meeting managers' information needs.

10.8.7 The first three models all have elements of an ad hoc approach to external information, whereas the information management model represents a systematic attempt to organise external information provision. It is surprising to find so few actual examples of this systematic approach in spite of the development of electronic information services which have made external information more readily accessible. In many respects, managers' use of external information has been little affected by the developments in information technology which have had such an impact on internal information services over the past few years. Only in the very largest companies are attempts now being made to establish more formal systematic approaches where electronic external information services can effectively contribute to the satisfaction of managers' information needs.

yy«data mi»

THE CITY UNIVERSITY

Northampton Square London EC1V 0HB
telephone: 01-253 4399 telex: 263896

The Centre for Business Systems Analysis
Ext: 3405/6/7

«ref»

Please reply to:
Angela Conyers
10 Gore Park Avenue
EASTBOURNE
East Sussex BN21 1QB

2 May 1986

Dear «name»

I am working on a research project which is looking at the role of external information in management in the light of developments in information technology. In particular, I am interested in how widely services such as Prestel and on-line commercial databases are being used and how they are viewed as sources of external information.

As a pilot project, I am sending out a questionnaire to a range of companies. I should be grateful for your co-operation in completing and returning the attached form. All information will naturally be treated in confidence. A stamped addressed envelope is enclosed for your reply.

If you feel that there is a more appropriate person in your company to answer this questionnaire, it would be most helpful if you could pass it on to them. A free copy of the findings of this project will be sent to all respondents. No company will be named in the report and no other individual identifying factors will be included.

Yours sincerely

Angela Conyers

«address»

THE ROLE OF EXTERNAL INFORMATION IN MANAGEMENT

1.Areas of external information

Below are listed some areas for which external information might be required. Please rate each area according to its importance for your organisation by circling the number on the scale.

	NOT IMPORTANT			VERY IMPORTANT
Acquisitions/mergers	1	2	3	4
Cost/price structure	1	2	3	4
Legislation	1	2	3	4
Consumer attitudes	1	2	3	4
Market trends	1	2	3	4
Technological developments	1	2	3	4
Competition	1	2	3	4
Introduction/deletion of products/services	1	2	3	4
Government policies	1	2	3	4
Technical information on products/processes	1	2	3	4
Demographic trends	1	2	3	4
Customers and suppliers- actual & potential	1	2	3	4
Current affairs	1	2	3	4
Economic conditions	1	2	3	4

2.Sources of external information

Please rate each of the following according to its importance to your organisation as a source of external information.

	NOT IMPORTANT			VERY IMPORTANT
Company personnel	1	2	3	4
Internal reports	1	2	3	4
External personal contacts	1	2	3	4
Newspapers and periodicals	1	2	3	4
Government reports	1	2	3	4
Professional/trade journals	1	2	3	4
Videotex (Prestel, Ceefax, Viewdata, etc.)	1	2	3	4
Commercial databases (Dialog, Datastar, Datastream, Textline, etc.)	1	2	3	4
Own library/information service	1	2	3	4
Other libraries/information services	1	2	3	4
Professional/trade associations	1	2	3	4

3.Internal information services

Are the following available within your organisation? Please circle your reply.

Library/information unit	Yes	No
Management Information System (MIS)	Yes	No
Marketing Information System (MkIS)	Yes	No
Private Viewdata System	Yes	No
Online database for storage & retrieval of co.information (eg Pergamon Infoline Private File Service)	Yes	No

4.Company details

Please tick the description which best fits your organisation.

Multinational company	....
National company with a number of sites	....
National company with a Head Office & one site	....

5.External information services

Are the following available to your organisation? Please circle your reply.

1. Prestel	Yes	No
2. Ceefax/Oracle	Yes	No
3. Bibliographic reference databases Dialog, Datastar, Infoline etc	Yes	No
4. Company information databases- JordanWatch, McCarthy etc	Yes	No
5 Financial databases- Datastream, Reuters, Telerate etc	Yes	No
6. Full-text databases- Datasolve, Textline, Nexis, etc	Yes	No
7. External information broker/bureau	Yes	No

6. Use of external information services

If you are using ANY of the services listed in 4 above, please give details on the next page.
If not, please go to section 7.

USE OF EXTERNAL INFORMATION SERVICES

If you are using ANY of the services listed in Section 5, in which department/functions are they being used? Please tick each appropriate box on the grid and list below the major databases or services in use.

	1 Prestel	2 Ceefax Oracle	3 Bibliog d/bases	4 Co inf d/bases	5 Fin d/bases	6 Full-text d/bases	7 Ext inform broker
MARKETING							
PRODUCTION							
PERSONNEL							
FINANCE							
RESEARCH & DEVELOPMENT							
LIBRARY/ INFORMATION UNIT							
MANAGEMENT SERVICES							
CORPORATE PLANNING							
COMPUTER SYSTEMS							
OTHER (please specify)							

Please list here the major databases or services used in each category.

1.

2

3.

4.

5.

6.

7.Comments

If you have any comments on the sources and use of external information within your organisation, please write them in the space below.

Name.....

Post title.....

Department..... Date.....

Thank you for your help in answering this questionnaire. If you wish to receive a summary report of the research please tick here

---

Please return to Angela Conyers, 10 Gore Park Avenue, Eastbourne, East Sussex BN21 1QB

THE CITY UNIVERSITY

Northampton Square London EC1V 0HB
telephone: 01-253 4399 telex: 263896

Department of Information Science
Head: Professor R. T. Bottle

Please reply to:
Angela Conyers
10 Gore Park Avenue
EASTBOURNE
East Sussex BN21 1QB

26 May 1987

Dear Sir

Has IT eased your information problems? I wonder if you would be kind enough to spend a few minutes to help a Ph.D. research project which is looking at management's use of external information in the light of developments in information technology. My particular interest is in how widely services such as on-line commercial databases and Prestel are being used and how you view them as information sources.

I have selected certain industries for detailed study and similar questionnaires are being sent out to a number of different executives and managers within these industries so that a composite picture of the value and use of external information can be built up.

A free copy of the findings of this project will be sent to all respondents who include their name and address on the questionnaire. No company will be named in this report and no other identifying factors will be given.

Your co-operation in completing and returning the enclosed form will be much appreciated. All information will naturally be treated in confidence. A stamped addressed envelope is included for your reply.

Yours faithfully

Angela Conyers

Angela Conyers

THE ROLE OF EXTERNAL INFORMATION IN MANAGEMENT

1. Areas of external information

Below are listed some areas for which external information might be required. Please rate each area according to your view of its importance to your organisation by circling the number on the scale.

	Not important			Very important
Acquisitions/mergers	1	2	3	4
Cost/price structure	1	2	3	4
Legislation	1	2	3	4
Consumer attitudes	1	2	3	4
Market trends	1	2	3	4
Technological developments	1	2	3	4
Competition	1	2	3	4
Introduction/deletion of products/services	1	2	3	4
Government policies	1	2	3	4
Technical information on products/process	1	2	3	4
Demographic trends	1	2	3	4
Customers & suppliers-actual & potential	1	2	3	4
Current affairs	1	2	3	4
Economic conditions	1	2	3	4

2. Sources of external information

Please rate each of the following according to your view of its importance to your organisation as a source of external information.

	Not important			Very important
Company personnel	1	2	3	4
Internal reports	1	2	3	4
External personal contacts	1	2	3	4
Newspapers and periodicals	1	2	3	4
Government reports	1	2	3	4
Professional/trade journals	1	2	3	4
Videotex (Prestel,Ceefax,Viewdata etc.)	1	2	3	4
Commercial databases (Dialog,Datastar, Datastream, Textline, etc.)	1	2	3	4
Own library/information service	1	2	3	4
Other libraries/information services	1	2	3	4
Professional/trade associations	1	2	3	4

3. Internal information services

Are the following available within your organisation? Please circle.

Library/information unit	Yes	No
Management Information System (MIS)	Yes	No
Marketing Information System (MkIS)	Yes	No
Private Viewdata system	Yes	No
Online database for storage & retrieval of information on your own company (eg Pergamon Infoline Private File Service)	Yes	No

4. External information services

A. Are any of the following services readily available to you? Please tick.

	No	Yes, used seldom	Yes, used often
1. *Prestel*	☐	☐	☐
2. *Ceefax/Oracle*	☐	☐	☐
3. *Bibliographic reference databases- Dialog, Datastar, Infoline etc.*	☐	☐	☐
4. *Company information databases- Jordanwatch, McCarthy etc.*	☐	☐	☐
5. *Financial databases- Reuters, Telerate etc.*	☐	☐	☐
6. *Full-text databases- Datasolve, Textline, Nexis etc.*	☐	☐	☐
7. *External information broker/bureau*	☐	☐	☐

B. In which departments/functions are these services being used? Please tick each appropriate box on the grid and complete section C below.

	1 Prestel	2 Ceefax Oracle	3 Bibliographic databases	4 Company inform. databases	5 Financial databases	6 Full text databases	7 External information broker
MARKETING							
PERSONNEL							
FINANCE							
RESEARCH & DEVELOPMENT							
LIBRARY/ INFORMATION UNIT							
MANAGEMENT SERVICES							
CORPORATE PLANNING							
COMPUTER SYSTEMS							
OTHER (please specify)							

C. Please underline the major databases or services used in categories 3-6

3. *Blaise. Datastar. Dialog. Pergamon Infoline.*
4. *Dataline. Dun & Bradstreet. ICC. Jordanwatch. McCarthy Online.*
5. *Datastream. Dow Jones. Telerate. Reuters. Topic.*
6. *Magic. Newsline. Nexis. Textline. World Reporter.*

Please list below other databases or services in use.

5. Availability of external information services

How are external information services made available in your organisation?

Centrally ...
In individual divisions ...
In individual locations ...
In individual functional areas ...

6. Comments

If you have any comments on the sources and use of external information within your organisation, please write them in the space below.

Post title .....

Department ..... Date .....

Thank you for your help in answering this questionnaire. If you wish to receive a summary report of the research, please write your name and address here.

Please return to **Angela Conyers, 10 Gore Park Avenue, Eastbourne, East Sussex BN21 1QB** in the stamped addressed envelope provided.

APPENDIX III - CASE STUDY INTERVIEW SCHEDULES

1. Librarians or information officers

A) Place of the library/information unit in the company structure

Departmental structure, reporting mechanisms
Relationship to other information services in the company
Main library/information unit users

B) Library/information unit services and use

Services provided eg current awareness, information bulletins, central purchase of journals
Types of information request received.
Comments on library services and use

C) Use of external information services

Use of videotex (Prestel/Ceefax/Oracle) by library/information unit and by end-users
Use of external databases by library/information unit and by end-users
Comments on value and use of external information services

D) Other sources of information for managers

Other sources of information used, eg personal contacts, trade associations.

2. Marketing and systems managers

A) Introduction

Manager's role in company and place in structure

B) Areas of external information of interest

Importance of external information, with specific examples of areas of most interest

C) Sources of external information used

Main sources used - personal, eg company personnel, external contacts
-impersonal, eg journals, trade associations
Recent examples where external information was needed and sources used.

D) Use of company library/information unit (where applicable)

Examples of use made of company library and type of information requests dealt with
Comments on library services

E) Internal information services

Description of internal information services available in the company eg Management Information Systems, Marketing Information Systems
Comments on value and use

F) Use of external information services

Videotex (Prestel/Ceefax/Oracle) - knowledge and awareness, use and comments on value.
External databases - knowledge and awareness, use and comments on value

APPENDIX IV - PILOT SURVEY RESULTS

1. INTRODUCTION

Fifty firms took part in the pilot survey, selected by random sample from the 'Times 1000' companies. Thirty-one questionnaires were returned, giving a response rate of 62%. The highest percentage of respondents (23%) came from the corporate planning area. Further details of respondents and an analysis of the methodology used in the pilot survey will be found in 3.3.

2. AREAS OF EXTERNAL INFORMATION

Respondents were asked in section 1 of the questionnaire to rate on a four point scale each of fourteen areas of external information according to its importance to their organization. Mean ratings on the scale are given in Table P1. Only two items (Competition and Market trends) achieved a mean rating of 3 or more ('important'/'very important') while only one (Demographic trends) scored less than two ('not important').

Areas rated by respondents as ' very important' with a rating of four on the four-point scale and as 'not important' with a rating of 1 are given in Tables P2-P3.

TABLE P1 Areas of information-mean rankings

	mean ranking (mean=2.59)
Market trends	3.17
Competition	3.10
Technological developments	2.77
Legislation	2.74
Economic conditions	2.74
Customers & suppliers	2.65
Government policies	2.64
Acquisitions & mergers	2.60
Consumer attitudes	2.53
Introduction/deletion of products/services	2.43
Cost/price structure	2.38
Technical information	2.37
Current affairs	2.23
Demographic trends	1.96

Table P2 Areas rated as 'very important'

	n (n=31)	%
Market trends	15	50
Competition	12	40
Consumer attitudes	9	30
Legislation	9	29
Customers & suppliers	8	28
Technological developments	8	27
Acquisitions & mergers	7	23
Economic conditions	7	23
Government policies	7	23
Cost/price structure	6	21
Introduction/deletion of products/services	6	20
Technical information	4	13
Current affairs	4	13
Demographic trends	2	7

Table P3 Areas rated as 'not important'

	n (n=31)	%
Demographic trends	13	45
Consumer attitudes	10	33
Current affairs	9	30
Cost/price structure	8	28
Technical information	7	23
Customers & suppliers	6	21
Acquisitions & mergers	5	17
Introduction/deletion of products/services	5	17
Legislation	5	16
Government policies	5	16
Market trends	4	13
Competition	3	10
Economic conditions	3	10
Technological developments	2	7

In Table P3, Demographic trends emerges as particularly unimportant, while views on Consumer attitudes are more mixed. Technological developments and Economic conditions, while not often rated as point 4 ('very important'), also received few ratings of point 1 ('not important').

3. SOURCES OF EXTERNAL INFORMATION

Mean rankings for sources of information are given in Table P4. External personal contacts had the highest mean ranking and came first also in the analysis of those who ranked each source as 'very important', although here Own library/information unit and Newspapers and periodicals were regarded as of equal importance. Those sources of

information considered 'very important' and 'not important' are given in Tables P5-P6.

Table P4 Sources of external information- mean rankings

	mean ranking (mean=2.49)
External personal contacts	2.97
Internal reports	2.84
Professional/trade journals	2.81
Newspapers & periodicals	2.77
Own library/information service	2.77
Company personnel	2.71
Other libraries/information services	2.42
Professional/trade assoc.	2.39
Government reports	2.23
Commercial databases	1.90
Videotex	1.61

Table P5 Sources of information rated as 'very important'

	n (n=31)	%
External personal contacts	9	29
Newspapers & periodicals	9	29
Own library/information	9	29
Internal reports	8	26
Professional/trade journals	3	10
Commercial databases	6	19
Other libraries/information service	6	19
Company personnel	5	16
Professional/trade assoc.	3	10
Government reports services	3	10
Videotex	1	3

Table P6 Sources of information rated as 'not important'

	n (n=31)	%
Videotex	18	58
Commercial databases	17	55
Government reports	7	23
Other libraries/information services	7	23
Professional/trade journals	4	13
Own library/information service	4	13
Professional/trade assoc.	4	13
Newspapers & periodicals	3	10
Company personnel	2	6
Internal reports	2	6
External personal contacts	2	6

No information source had a mean rating of 3 or more and two (Videotex and Commercial databases) were rated below 2. Commercial databases were ranked as 'very important' by 19% of respondents, but came second to last in the mean ratings. On the other hand, Videotex was rated as 'very important' by only 3% of respondents and was also last in the mean ratings.

4. INTERNAL INFORMATION SERVICES

Numbers of respondents reporting use of the various internal information services listed in section 3 of the questionnaire are shown in Table P7.

5. COMPANY DETAILS

Twenty respondents (64%) were from multinational companies, ten (32%) from national companies with a number of sites and one from a national company with one site.

This section was dropped in the main survey and replaced with a section on the availability of information services (see 3.4.1). The information, if needed, could be obtained from other sources and company size and type of industry appeared to be more significant variables of information use.

Table P7. Internal information services

	n (n=31)	%
Library/information unit	23	74
Management Information System	15	48
Marketing Information System	12	39
Online database for company information	11	35
Private viewdata	10	32

6 EXTERNAL INFORMATION SERVICES

The number of respondents reporting use of the various external information services in section 5 of the questionnaire is given in table P8.

Table P8 . Individual use of external services

	n (n=31)	%
External broker	16	52
Financial	14	45
Prestel	14	45
Ceefax/Oracle	12	39
Company information	9	29
Bibliographic	6	21
Full text	5	16

The most frequently cited source of external information was in fact the information broker, used by over half the respondents. Next in frequency were Prestel and financial databases.

This section was expanded in the main survey to give an indication of frequency of use, by asking respondents to mark for each information service used whether use was 'often' or 'seldom'.

7. USE OF EXTERNAL INFORMATION SERVICES

Respondents were asked to indicate on a grid in which departments the various external services listed were being used. 25 respondents (81%) completed this grid. Results were then analysed to work out the percentage of total mentions attributable to each department.

Table P9 Departmental use of external services

	no. of mentions (n=114)	%
Finance	27	24
Marketing	25	22
Library/Information unit	22	19
Corporate planning	10	9
Personnel	4	4
Other	6	5
Research & Development	5	4
Management services	4	4
Computer systems	3	3

Heaviest use was in marketing, finance, library and corporate planning, which together accounted for three-quarters of total use.

An analysis of the number of times that each service was mentioned on the grid provides some guide as to its overall use within the company (see Table P10) although it must be stressed that this does not indicate frequency of use of the particular service, nor does it necessarily provide a company-wide view, as a number of respondents replied that they did not have sufficient information to answer this section on behalf of the whole company.

Table P10 Company use of external information services

	no. of mentions (n=114)	%
External broker	27	24
Prestel	21	18
Co. information	19	17
Ceefax/Oracle	13	11
Financial	13	11
Full-text	12	11
Bibliographic	9	8

As with individual use, the external broker receives the highest percentage of mentions, but no service available within the company itself received more than 20% of the total.

The grid was left unaltered in the main survey, but instead of asking respondents to list services used, a list of the most common services was provided and respondents asked to underline the ones in use. This was done to gain fuller information, as a number of respondents failed to list the services in use.

8. COMMENTS FROM RESPONDENTS

Out of 31 respondents completing questionnaires, 13 (42%) requested a copy of the summary report of the findings and 11 (35%) wrote comments. Comments relating to research methodology are discussed in 3.3.7 and other comments have been incorporated at appropriate points in the thesis.

9 EXTENT OF USE OF EXTERNAL INFORMATION SERVICES

Pilot survey respondents were classified into groups according to the number of external information services available to them (cf section 8.5). Numbers in each group were as follows:

	n	%
Non-users	3	10
Limited users (1-2 services)	12	39
Medium users (3-4)	11	35
Extensive users (5 or over)	5	16

All extensive users were from the librarian/information officer or corporate planning groups amd from medium or large companies. Four out of the five rated Commercial databases as 'very important' on the four-point scale.

Ratings for videotex were much lower. The main printed sources (Newspapers and periodicals and Professional/trade journals) were also considered 'important/very important' to this group and the area of Acquisitions and mergers received a higher rating from extensive users.

Limited and non-users came mainly from the management services, finance and computer systems groups and from smaller companies. Areas in general received a lower rating, especially Consumer attitudes, Demographic trends, Customers and suppliers and Current affairs. Sources also had lower ratings than with medium or extensive users. Videotex again had a low rating, apart from a travel trade respondent who used Prestel and considered it 'very important'. Among limited users, Commercial databases were not highly regarded, especially by those who had access only to financial databases.

There was no correlation between limited use of external services and extent of use of internal information services. Apart from libraries, which were less common in the limited user group, internal information services were generally found in the same proportion across all user groups.

10. FURTHER ANALYSIS OF PILOT SURVEY

Detailed analysis of the results by company size and functional group was not possible because of the small number of respondents involved in each group. Nevertheless, it was apparent that both these variables had some effect on the overall results. For this reason a more structured approach to company size and functional groups was adopted in the main survey.

Analysis by company type was not possible because of the wide range of industries represented. It was decided that the main survey should concentrate on particular industries so that more detailed breakdown by company type could be carried out.

TABLE A1 RESPONDENTS BY TYPE OF INDUSTRY

	Oil		Pharm		Elect		Const		Retail		Total
	n	%	n	%	n	%	n	%	n	%	n
Librarian	6	23	12	39	0	0	1	6	3	12	22
Corporate planning	3	11	3	10	1	4	3	17	3	12	13
Management services	1	4	4	13	3	13	1	6	1	4	10
Computer systems	5	19	0	0	6	26	4	22	7	29	22
Finance	5	19	5	16	4	17	5	28	5	21	24
Marketing	6	23	5	16	8	35	4	22	4	17	27
Other	0	0	2	6	1	4	0	0	1	4	4
Total	26		31		23		18		24		122

Key

Oil	Oil
Pharm	Pharmaceutical
Elect	Electronic
Const	Construction
Retail	Retail

TABLE A2 RESPONDENTS BY COMPANY SIZE

	Small		Medium		Large		Total
	n	%	n	%	n	%	
Librarian	2	6	6	16	14	26	22
Corporate planning	2	6	4	10	7	13	13
Management services	4	13	2	5	4	7	10
Computer systems	3	10	8	21	11	21	22
Finance	7	23	8	21	9	17	24
Marketing	11	35	8	21	8	15	27
Other	2	6	2	5	0	0	4
Total	31		38		53		122

TABLE A3 AREAS - MEAN RANKING BY INDUSTRY GROUP

	Mean	Oil (n=26)	Pharm (n=31)	Elect (n=23)	Const (n=18)	Retail (n=24)	Sig
Competition	3.38	3.23	3.61	3.39	3.22	3.37	.4428
Market trends	3.21	3.04	3.32	3.35	3.00	3.29	.6086
Technological developments	3.04	2.69	3.35	3.43	2.94	2.71	.0058
Legislation	2.93	2.69	3.39	2.61	2.94	2.92	.0306
Customers & suppliers	2.86	2.73	2.61	3.13	3.00	2.96	.3595
Acquisitions & mergers	2.86	3.00	2.84	2.56	3.39	2.62	.1570
Economic conditions	2.84	2.85	2.87	2.61	3.11	2.79	.4302
Consumer attitudes	2.72	2.38	3.00	2.74	1.89	3.33	.0006
Government policies	2.72	2.46	3.29	2.35	2.94	2.46	.0017
Technical information	2.68	2.42	3.13	2.78	2.50	2.42	.0301
Cost/price structure	2.58	2.61	2.55	2.56	2.39	2.75	.9036
Introduction/deletion of products/services	2.39	2.04	2.71	2.26	2.39	2.50	.1016
Demographic trends	2.31	1.96	2.61	2.04	2.11	2.71	.0244
Current affairs	2.31	2.46	2.61	1.83	2.33	2.21	.0156
Mean	2.97	2.61	2.99	2.69	2.72	2.79	

Key

Oil	Oil
Pharm	Pharmaceutical
Elect	Electronic
Const	Construction
Retail	Retail

Sig Significance level. Differences between groups which are statistically significant ($p < .05$) are shown in bold

TABLE A4 SOURCES - MEAN RANKING BY INDUSTRY GROUP

	Mean	Oil (n=26)	Pharm (n=31)	Elect (n=23)	Const (n=18)	Retail (n=24)	Sig
External personal contacts	3.16	3.08	3.39	3.39	2.72	3.08	.0353
Professional/trade journals	3.11	3.23	3.45	3.00	2.78	2.87	.0448
Newspapers & periodicals	3.01	3.15	3.16	2.91	2.78	2.92	.4812
Company personnel	2.97	3.19	2.90	3.00	2.83	2.92	.7397
Internal reports	2.77	2.69	2.81	2.87	2.61	2.83	.8405
Own library/information service	2.75	3.08	3.35	1.96	2.56	2.54	.0000
Professional/trade assoc.	2.66	2.61	2.90	2.52	2.39	2.71	.3459
Government reports	2.47	2.50	2.97	2.13	2.22	2.17	.0058
Other libraries/information services	2.42	2.58	2.77	2.13	2.17	2.25	.0503
Commercial databases	2.34	2.81	3.10	2.00	1.78	1.67	.0000
Videotex	1.64	1.73	1.68	1.78	1.17	1.71	.1522
Mean		2.83	2.95	2.53	2.36	2.51	

Key

Oil Oil
Pharm Pharmaceutical
Elect Electronic
Const Construction
Retail Retail

Sig Significance level. Differences between groups which are statistically significant ($p < .05$) are shown in bold

TABLE A5 INTERNAL INFORMATION SERVICES BY INDUSTRY GROUP

	Oil (n=26)		Pharm (n=31)		Elect (n=23)		Const (n=18)		Retail (n=24)		
	n	%	n	%	n	%	n	%	n	%	Sig
Library/ information unit	25	96	31	100	11	48	15	83	16	67	.0000
Management Information System	21	81	21	68	17	74	13	72	18	75	.5774
Marketing Information System	13	50	24	77	10	43	8	44	8	33	.0338
Private viewdata system	8	31	11	35	6	26	4	22	8	33	.3363
Online database for company information	8	31	17	55	8	35	6	33	7	29	.7113

Key

Oil Oil
Pharm Pharmaceutical
Elect Electronic
Const Construction
Retail Retail

Sig Significance level. Differences between groups which are statistically significant ($p < .05$) are shown in bold

TABLE A6. EXTERNAL INFORMATION SERVICES BY INDUSTRY GROUP

	Oil (n=26)		Pharm (n=31)		Elect (n=23)		Const (n=18)		Retail (n=24)		
	n	%	n	%	n	%	n	%	n	%	sig
Prestel	10	38	22	71	9	39	10	56	9	37	.0909
Ceefax/Oracle	9	35	16	52	8	35	9	50	9	37	.4592
Bibliographic	14	54	25	81	5	22	5	28	7	29	.0010
Co. information	16	61	23	74	7	30	9	50	8	33	.0053
Financial	19	73	22	71	5	22	8	44	11	46	.0186
Full-text	13	50	23	74	6	26	5	28	3	12	.0002
External broker	18	69	23	74	11	48	11	61	11	46	.1969

TABLE A7 FREQUENCY OF USE OF EXTERNAL INFORMATION SERVICES BY INDUSTRY GROUP

	Oil		Pharm		Elect		Const		Retail		
	n	%	n	%	n	%	n	%	n	%	sig
Prestel	3	30	3	14	1	11	0	0	0	0	.2101
Ceefax/Oracle	1	11	6	37	1	12	0	0	2	22	.1881
Bibliographic	6	43	22	88	2	40	0	0	2	29	.0004
Co. information	9	56	16	70	2	29	3	33	4	50	.2230
Financial	15	79	8	36	2	40	5	62	6	54	.0867
Full-text	7	54	11	48	2	33	4	80	2	67	.5841
External broker	6	33	9	39	5	45	5	45	4	36	.9564

Note: In this table, n= number of users using these services 'often'
%= number of 'often' users as a percentage of total

Key
Oil Oil
Pharm Pharmaceutical
Elect Electronic
Const Construction
Retail Retail

Sig Significance level. Differences between groups which are statistically significant ($p < .05$) are shown in bold

TABLE A8 COMPANY USE OF EXTERNAL INFORMATION SERVICES BY INDUSTRY GROUP (1)

	Oil		Pharm		Elect		Const		Retail	
	n	%	n	%	n	%	n	%	n	%
Prestel	7	6	24	11	13	17	13	14	11	13
Ceefax/Oracle	6	5	17	8	7	9	8	8	9	11
Bibliographic	11	9	40	18	6	8	11	12	10	12
Company information	31	26	40	18	12	16	21	22	16	19
Financial	25	21	36	16	10	13	15	16	14	17
Full/text	16	13	31	14	10	13	9	10	6	7
Broker	27	22	30	14	16	22	18	19	16	19
Total	123		218		74		95		82	

TABLE A9 COMPANY USE OF EXTERNAL INFORMATION SERVICES BY INDUSTRY GROUP(2)

	Oil		Pharm		Elect		Const		Retail	
	n	%	n	%	n	%	n	%	n	%
Marketing	26	22	38	17	20	27	22	23	18	22
Personnel	7	6	4	2	1	1	2	2	1	1
Finance	19	16	34	16	25	34	30	32	22	27
Research & Development	7	6	21	10	4	5	7	7	6	7
Library	27	22	66	30	2	3	6	6	20	24
Management services	5	4	10	5	8	11	7	7	1	1
Corporate planning	19	15	34	16	7	9	14	15	7	8
Computer systems	7	6	4	2	3	4	0	0	4	5
Other	6	5	7	3	4	5	7	7	3	4
Total	123		218		74		95		82	

Key

Oil	Oil
Pharm	Pharmaceutical
Elect	Electronic
Const	Construction
Retail	Retail

TABLE A10 AVAILABILITY OF EXTERNAL INFORMATION SERVICES BY INDUSTRY GROUP

	Oil (n=26)		Pharm (n=31)		Elect (n=23)		Const (n=18)		Retail (n=24)	
	n	%	n	%	n	%	n	%	n	%
Central	5	19	8	26	5	22	5	28	4	17
Divisions	2	8	5	16	1	4	3	17	4	17
Locations	3	11	2	6	4	17	1	6	5	21
Functions	7	27	3	10	8	35	3	17	4	17
Mixed	8	31	12	39	2	9	5	28	3	12
Not given	1	4	1	3	3	13	1	6	4	17

Key

Oil	Oil
Pharm	Pharmaceutical
Elect	Electronic
Const	Construction
Retail	Retail

TABLE A11 INTEREST IN QUESTIONNAIRE BY INDUSTRY GROUP

	Comments		Copy requested	
	n	%	n	%
Oil	9	35	15	58
Pharmaceutical	14	45	19	61
Electronic	7	30	14	61
Construction	4	22	5	28
Retail	5	21	8	33

TABLE A12 AREAS - MEAN RANKING BY COMPANY SIZE

	Mean	Small (n=31)	Medium (n=38)	Large (n=53)	Sig
Competition	3.38	3.16	3.40	3.49	.2187
Market trends	3.21	2.97	3.34	3.26	.2437
Technological developments	3.04	2.84	3.08	3.13	.3783
Legislation	2.93	2.94	2.97	2.91	.9502
Customers & suppliers	2.86	2.71	3.10	2.77	.1997
Acquisitions & mergers	2.86	2.61	2.95	2.94	.3903
Economic conditions	2.84	2.74	2.76	2.94	.4551
Consumer attitudes	2.72	2.81	2.63	2.74	.8328
Government policies	2.72	2.58	2.76	2.77	.6818
Technical information	2.68	2.26	3.03	2.68	**.0055**
Cost/price structure	2.58	2.48	2.65	2.58	.8262
Introduction/deletion of products/services	2.39	2.19	2.53	2.41	.3517
Demographic trends	2.31	1.97	2.47	2.40	.1023
Current affairs	2.31	2.06	2.26	2.49	.0886
Mean		2.59	2.85	2.85	

Sig Significance level. Differences between groups which are statistically significant ($p \leq .05$) are shown in **bold**

TABLE A13 SOURCES - MEAN RANKING BY COMPANY SIZE

	Mean	Small (n=31)	Medium (n=38)	Large (n=53)	Sig
External personal contacts	3.16	3.00	3.08	3.32	.1571
Professional/trade journals	3.11	3.13	3.05	3.13	.9048
Newspapers & periodicals	3.01	2.87	3.05	3.06	.5980
Company personnel	2.97	2.81	3.18	2.92	.2335
Internal reports	2.77	2.64	2.71	2.89	.3731
Own library/information service	2.75	2.42	2.58	3.07	**.0065**
Professional/trade assoc.	2.66	2.71	2.63	2.64	.9290
Government reports	2.47	2.61	2.37	2.47	.5442
Other libraries/information services	2.42	2.19	2.39	2.57	.2153
Commercial databases	2.34	1.90	2.47	2.51	.0720
Videotex	1.64	1.39	1.92	1.58	**.0279**
Mean		2.50	2.65	2.77	

Sig Significance level. Differences between groups which are statistically significant ($p < .05$) are shown in **bold**

TABLE A14 INTERNAL INFORMATION SERVICES BY COMPANY SIZE

	Small (n=31)		Medium (n=38)		Large (n=51)		Sig
	n	%	n	%	n	%	
Library/ information unit	9	61	28	74	51	96	**.0002**
Management Information System	18	58	26	68	46	87	**.0261**
Marketing Information System	10	32	17	45	36	68	**.0109**
Private viewdata system	5	16	10	26	22	41	.0711
Online database for company information	3	10	12	32	31	58	**.0000**

Sig Significance level. Differences between groups which are statistically significant ($p \leq .05$) are shown in **bold**

TABLE A15 EXTERNAL INFORMATION SERVICES BY COMPANY SIZE

	Small (n=31)		Medium (n=38)		Large (n=53)		Sig
	n	%	n	%	n	%	
Prestel	6	19	18	47	36	68	**.0004**
Ceefax/Oracle	11	35	14	37	26	49	.4857
Bibliographic	5	16	18	47	33	62	**.0009**
Co. information	11	35	16	42	36	68	**.0059**
Financial	9	29	17	45	39	74	**.0015**
Full-text	5	16	15	39	30	57	**.0014**
External broker	15	48	23	60	36	68	.3887

Sig Significance level. Differences between groups which are statistically significant ($p < .05$) are shown in **bold**

TABLE A16 FREQUENCY OF USE OF EXTERNAL INFORMATION SERVICES BY COMPANY SIZE

	Small		Medium		Large		Sig
	n	%	n	%	n	%	
Prestel	0	0	1	6	6	17	.3138
Ceefax/Oracle	2	18	2	14	6	23	.7928
Bibliographic	2	40	12	67	18	54	.5072
Co. information	5	45	10	62	19	53	.6669
Financial	4	44	8	47	24	61	.4699
Full-text	1	20	10	67	15	50	.1834
External broker	7	47	6	26	16	44	.2973

Note: In this table, n=number of users using these services 'often'
%=number of 'often' users as a percentage of total users

Sig Significance level. No differences between groups are statistically significant

TABLE A17 AVAILABILITY OF EXTERNAL INFORMATION SERVICES BY COMPANY SIZE

	Small (n=31)		Medium (n=38)		Large (n=53)	
	n	%	n	%	n	%
Central	5	16	6	16	16	30
Divisions	1	3	6	16	8	15
Locations	6	19	5	13	4	7
Functions	8	26	9	24	8	15
Mixed	3	10	10	26	17	32
Not given	8	26	2	5	0	0

TABLE A18 INTEREST IN QUESTIONNAIRE BY COMPANY SIZE

	Comments		Copy requested	
	n	%	n	%
Small	9	29	13	42
Medium	11	29	20	53
Large	19	36	29	55

TABLE A19 AREAS - MEAN RANKING BY FUNCTIONAL GROUP

	Lib (n=22)	CorpPl (n=13)	ManS (n=10)	Sys (n=22)	Fin (n=24)	Mark (n=27)	Sig
Competition	3.64	3.38	3.30	3.45	3.04	3.44	.4574
Market trends	2.86	3.54	3.20	3.36	3.00	3.37	.3819
Technological developments	3.36	3.08	3.20	3.14	2.75	2.81	.3199
Legislation	3.09	3.15	3.00	2.64	3.04	2.78	.6316
Customers & suppliers	2.59	2.54	2.20	3.36	3.12	2.85	.0353
Acquisitions & mergers	3.23	3.15	2.00	2.54	3.08	2.96	.0311
Economic conditions	3.14	3.15	2.60	2.73	2.75	2.67	.3765
Consumer attitudes	2.59	2.92	2.40	2.68	2.67	2.93	.9178
Government policies	3.04	3.08	3.00	2.31	2.75	2.44	.1199
Technical information	3.23	2.69	3.10	2.82	2.12	2.44	.0072
Cost/price structure	2.41	2.92	2.50	2.59	2.54	2.74	.3992
Introduction/deletion of products/services	2.59	2.38	2.30	2.59	2.21	2.26	.8116
Demographic trends	2.50	2.54	1.60	2.59	2.29	2.22	.1689
Current affairs	3.00	2.31	2.00	2.18	2.25	2.11	.0065
Mean	2.95	2.92	2.60	2.78	2.69	2.72	

Key

Lib Librarian/information officer
CorpPl Corporate planning manager
ManS Management services manager
Fin Finance manager
Mark Marketing manager

Sig Significance level. Differences between groups which are statistically significant ($p \leq .05$) are shown in bold

TABLE A20 SOURCES - MEAN RANKING BY FUNCTIONAL GROUP

	Lib (n=22)	CorpPl (n=13)	ManS (n=10)	Sys (n=22)	Fin (n=24)	Mark (n=27)	Sig
External personal contacts	3.18	3.08	3.30	3.18	3.18	3.15	.9989
Professional/trade journals	3.54	3.17	3.10	2.81	2.81	3.15	.1236
Newspapers & periodicals	3.64	3.42	3.00	2.59	2.72	2.89	.0017
Company personnel	2.95	2.69	2.70	2.91	3.09	3.30	.0301
Own library/information service	3.68	3.08	2.20	2.00	2.69	2.81	.0000
Internal reports	2.59	2.83	2.90	2.63	2.91	2.85	.9158
Professional/trade assoc.	2.77	2.25	2.90	2.50	2.91	2.67	.3735
Government reports	3.23	2.25	2.70	2.04	2.36	2.33	.0003
Commercial databases	3.45	2.17	1.80	1.95	2.14	2.11	.0008
Other libraries/information services	3.36	2.58	1.90	1.95	2.18	2.33	.0000
Videotex	1.59	1.75	1.10	1.63	1.82	1.70	.6440
Mean	3.10	2.67	2.51	2.38	2.62	2.66	

Key

Lib Librarian/information officer
CorpPl Corporate planning manager
ManS Management services manager
Fin Finance manager
Mark Marketing manager

Sig Significance level. Differences between groups which are statistically significant ($p \leq .05$) are shown in bold

TABLE A21 SOURCES RATED 'VERY IMPORTANT' BY FUNCTIONAL GROUP

	Lib (n=22)		CorpPl (n=13)		ManS (n=10)		Sys (n=22)		Fin (n=24)		Mark (n=27)		Sig
	n	%	n	%	n	%	n	%	n	%	n	%	
External personal contacts	10	45	3	23	4	40	9	41	9	37	11	41	.6945
Professional/trade journals	14	64	5	38	4	40	8	36	3	12	11	41	.5826
Newspapers & periodicals	15	68	5	38	3	30	4	48	3	12	7	26	.0143
Company personnel	5	23	3	23	3	30	8	37	10	42	13	48	.0000
Own library/information service	16	73	4	31	1	10	1	4	3	12	6	22	.0001
Internal reports	4	18	1	8	2	20	3	14	7	29	7	26	.6627
Professional/trade assoc.	4	18	0	0	2	20	2	9	6	25	5	18	.6557
Government reports	10	45	0	0	0	0	1	4	1	4	1	4	.0014
Commercial databases	16	73	2	15	1	10	1	4	6	25	4	15	.0016
Other libraries/information services	11	50	2	15	1	10	1	4	1	4	2	7	.0019
Videotex	0	0	1	8	0	0	0	0	2	8	2	7	.5619

Key

Lib Librarian/information officer
CorpPl Corporate planning manager
ManS Management services manager
Fin Finance manager
Mark Marketing manager

Sig Significance level. Differences between groups which are statistically significant ($p < .05$) are shown in bold

TABLE A22 EXTERNAL INFORMATION SERVICES BY FUNCTIONAL GROUP

	Lib (n=21)		CorpPl (n=13)		ManS (n=10)		Sys (n=22)		Fin (n=24)		Mark (n=26)		Sig
	n	%	n	%	n	%	n	%	n	%	n	%	
Prestel	14	64	7	54	5	50	11	50	14	58	7	26	.5528
Ceefax/Oracle	12	54	4	31	3	30	7	32	15	62	7	26	.4978
Bibliographic	20	91	8	61	2	20	8	36	10	42	7	26	.0104
Company inf	19	86	8	61	2	20	8	36	14	58	11	41	.0048
Financial	16	73	6	42	4	40	13	59	15	62	8	30	.2241
Full-text	20	91	7	54	3	30	6	27	7	29	5	18	.0002
External broker	17	77	11	85	7	70	7	32	16	67	14	52	.1994

TABLE A23 FREQUENCY OF USE OF EXTERNAL INFORMATION SERVICES BY FUNCTIONAL GROUP

	Lib		CorpPl		ManS		Sys		Fin		Mark		Sig
	n	%	n	%	n	%	n	%	n	%	n	%	
Prestel	2	14	0	0	0	0	3	27	2	14	0	0	.5920
Ceefax/Oracle	5	42	1	25	0	0	0	0	3	20	0	0	.0849
Bibliographic	17	85	3	37	2	100	3	37	4	40	2	29	.0232
Company inf	14	74	2	25	0	0	4	50	9	64	4	36	.0916
Financial	16	73	6	42	4	40	13	59	15	62	8	30	.2241
Full-text	9	56	3	50	1	25	9	69	9	60	4	50	.5293
External broker	7	41	5	45	3	43	2	29	3	19	9	64	.2120

Note: n=number of users using these services 'often'
%=number of 'often' users as a percentage of total users

Key
Lib Librarian/information officer
CorpPl Corporate planning manager
ManS Management services manager
Fin Finance manager
Mark Marketing manager

Sig Significance level. Differences between groups which are statistically significant ($p \leq .05$) are shown in bold

TABLE A24 INTEREST IN QUESTIONNAIRE BY FUNCTIONAL GROUP

	Comments		Copy requested	
	n	%	n	%
Librarian	10	45	16	73
Corporate planning	5	38	7	54
Management services	4	40	3	30
Systems	8	36	11	50
Finance	2	8	8	33
Marketing	7	26	15	55

TABLE A25 AREAS - MEAN RANKING BY USER GROUP

	Mean	Non (n=16)	Lim (n=30)	Med (n=27)	Ext (n=49)	Sig
Competition	3.38	3.31	3.24	3.41	3.47	.7193
Market trends	3.21	3.62	3.10	2.96	3.26	.1217
Technological developments	3.04	2.81	3.07	3.04	3.08	.9008
Legislation	2.93	3.06	2.86	3.26	2.73	.1321
Customers & suppliers	2.86	3.12	3.00	2.67	2.84	.6091
Acquisitions & mergers	2.86	2.62	2.69	2.70	3.10	.3167
Economic conditions	2.82	2.37	3.00	2.85	2.85	.2128
Consumer attitudes	2.72	3.19	2.59	2.67	2.71	.6317
Government policies	2.72	2.50	2.69	2.63	2.84	.7721
Technical information	2.68	2.30	2.79	2.67	2.73	.5080
Cost/price structure	2.58	2.75	2.62	2.44	2.57	.8425
Introduction/deletion of products/services	2.39	2.37	2.55	2.22	2.41	.6432
Demographic trends	2.31	2.31	2.34	2.07	2.45	.5125
Current affairs	2.31	1.94	2.10	2.33	2.53	.0726
Mean		2.73	2.76	2.71	2.83	

Key:
- Non — Non-user of electronic information services
- Lim — Limited user (1=2 services)
- Med — Medium user (3-4 services)
- Ext — Extensive user (5 or more services)
- Sig — Significance level. No differences between groups are statistically significant.

TABLE A26 SOURCES - MEAN RANKING BY USER GROUP

	Mean (n=16)	Non (n=30)	Lim (n=27)	Med (n=49)	Ext	Sig
External personal contacts	3.16	3.00	3.40	2.96	3.24	.1713
Professional/trade journals	3.11	2.94	3.10	2.92	3.24	.4837
Newspapers & periodicals	3.01	2.94	2.96	2.81	3.14	.4628
Company personnel	2.97	2.87	3.14	2.85	2.98	.6996
Internal reports	2.77	2.87	3.03	2.61	2.67	.1530
Own library/information service	2.75	2.31	2.24	2.61	3.24	.0000
Professional/trade assoc.	2.66	2.50	2.86	2.46	2.67	.4202
Government reports	2.47	2.06	2.41	2.46	2.61	.3847
Other libraries/information services	2.42	2.00	2.24	2.15	2.75	.0122
Commercial databases	2.34	1.87	1.55	2.19	3.00	.0000
Videotex	1.64	1.37	1.48	1.54	1.84	.2111
Mean		2.43	2.58	2.5	2.89	

Key:
- Non — Non-user of electronic information services
- Lim — Limited user (1=2 services)
- Med — Medium user (3-4 services)
- Ext — Extensive user (5 or more services)
- Sig — Significance level. Differences between groups which are statistically significant ($p \leq .05$) are shown in bold.

TABLE A27 INTERNAL INFORMATION SERVICES BY USER GROUP

	Non (n=16)		Lim (n=30)		Med (n=27)		Ext (n=49)		Sig
	n	%	n	%	n	%	n	%	
Library/ information unit	9	56	21	70	23	85	45	92	**.0079**
Management Information System	10	62	22	73	19	70	39	80	.5085
Marketing Information System	4	25	13	43	15	56	31	63	.0942
Private viewdata system	3	19	5	17	8	30	21	43	.2162
Online database for company information	1	6	10	33	8	30	25	53	**.0128**

Key: **Non** Non-user of electronic information services
Lim Limited user (1=2 services)
Med Medium user (3-4 services)
Ext Extensive user (5 or more services)

Sig Significance level. Differences between groups which are statistically significant ($p < .05$) are shown in **bold**.

TABLE A28 EXTERNAL INFORMATION SERVICES BY USER GROUP

	Limited (n=30)		Medium (n=27)		Extensive (n=49)		Sig.
	n	%	n	%	n	%	
Prestel	9	30	18	67	38	78	.0000
Ceefax/Oracle	7	23	13	48	31	63	.0009
Bibliographic	4	13	9	33	43	88	.0000
Company information	5	17	16	59	42	86	.0000
Financial	9	30	18	67	38	78	.0000
Full-text	3	10	8	30	39	80	.0000
External broker	16	53	18	67	40	82	.0000

TABLE A29 FREQUENCY OF USE OF EXTERNAL INFORMATION SERVICES BY USER GROUP

	Limited (n=30)		Medium (n=27)		Extensive (n=49)		Sig.
	n	%	n	%	n	%	
Prestel	1	20	1	7	5	12	.6950
Ceefax/Oracle	0	0	2	15	8	26	.2712
Bibliographic	0	0	4	44	28	65	.0296
Company information	3	60	5	31	26	62	.1074
Financial	4	44	12	67	20	53	.4772
Full-text	1	33	4	50	21	54	.7847
External broker	8	50	7	39	14	35	.5828

Note: n=number of users using these services 'often'
%=number of 'often' users as a percentage of total users

Sig Significance level. Differences between groups which are statistically significant ($p \leq .05$) are shown in **bold**.

TABLE A30 AVAILABILITY OF EXTERNAL INFORMATION SERVICES BY USER GROUP

	Non-user (n=16)		Limited (n=30)		Medium (n=27)		Extensive (n=49)	
	n	%	n	%	n	%	n	%
Central	2	12	3	10	8	30	14	29
By divisions	3	19	1	3	4	15	7	14
By locations	3	19	7	23	1	4	4	8
By functions	3	19	11	37	5	18	6	12
Mixed	0	0	5	17	7	26	18	37
Not given	5	31	3	10	2	7	0	0

TABLE A31 INTEREST IN QUESTIONNAIRE BY USER GROUP

	Comments		Copy requested	
	n	%	n	%
Non-user	4	25	5	31
Limited user	10	34	13	45
Medium user	5	18	16	59
Extensive user	19	39	27	55

TABLE A32 ATTITUDES TO LIBRARY BY INDUSTRY GROUP

	Oil (n=25)		Pharm (n=31)		Elect (n=11)		Const (n=15)		Retail (n=16)	
	n	%	n	%	n	%	n	%	n	%
Not important	0	0	0	0	1	9	1	7	1	6
Fairly important	5	20	3	10	7	64	5	33	3	19
Important	11	44	14	45	1	9	6	40	8	50
Very important	9	36	14	45	2	18	3	20	4	25

Key Oil Oil
Pharm Pharmaceutical
Elect Electronic
Const Construction
Retail Retail

TABLE A33 ATTITUDES TO LIBRARY BY COMPANY SIZE

	Small (n=19)		Medium (n=28)		Large (n=51)	
	n	%	n	%	n	%
Not important	1	5	1	4	1	2
Fairly important	5	26	7	25	11	22
Important	9	47	10	36	20	41
Very important	4	21	10	36	17	35

TABLE A34 ATTITUDES TO LIBRARY BY FUNCTIONAL GROUP

	Lib (n=22)		CorpPl (n=13)		ManS (n=7)		Sys (n=15)		Fin (n=18)		Mark (n=21	
	n	%	n	%	n	%	n	%	n	%	n	%
Not important	0	0	0	0	1	14	1	7	0	0	1	6
Fairly important	1	4	3	23	2	29	7	47	5	28	5	24
Important	5	23	6	46	3	43	6	40	10	56	9	43
Very important	16	73	4	31	1	14	1	7	3	17	6	29

TABLE A35 ATTITUDES TO LIBRARY BY USER GROUP

	Non-user (n=9)		Limited (n=21)		Medium (n=23)		Extensive (n=45)	
	n	%	n	%	n	%	n	%
Not important	3	33	0	0	0	0	0	0
Fairly important	1	11	11	52	6	26	5	11
Important	4	44	7	33	12	52	16	38
Very important	2	11	2	14	5	22	22	51

TABLE A36 ATTITUDES TO VIDEOTEX BY USERS OF PRESTEL

	used often (n=7)		used seldom (n=53)	
	n	%	n	%
Not important	0	0	19	36
Fairly important	4	57	23	43
Important	2	29	7	13
Very important	1	14	2	4
No reply given	0	0	2	4

TABLE A37 ATTITUDES TO VIDEOTEX BY USERS OF CEEFAX/ORACLE

	used often (n=10)		used seldom (n=41)	
	n	%	n	%
Not important	1	10	18	44
Fairly important	5	50	16	39
Important	2	20	3	7
Very important	2	20	1	2
No reply given	0	0	3	7

TABLE A38 ATTITUDES TO COMMERCIAL DATABASES BY USERS OF BIBLIOGRAPHIC DATABASES

	used often (n=32)		used seldom (n=24)	
	n	%	n	%
Not important	0	0	2	8
Fairly important	2	6	8	33
Important	9	28	8	33
Very important	20	62	5	21
No reply given	1	3	1	4

TABLE A39 ATTITUDES TO COMMERCIAL DATABASES BY USERS OF COMPANY INFORMATION DATABASES

	used often (n=34)		used seldom (n=29)	
	n	%	n	%
Not important	3	8	4	14
Fairly important	4	12	11	38
Important	8	23	4	14
Very important	18	53	8	28
No reply given	1	3	2	7

TABLE A40 ATTITUDES TO COMMERCIAL DATABASES BY USERS OF FINANCIAL DATABASES

	used often (n=36)		used seldom (n=29)	
	n	%	n	%
Not important	4	11	5	17
Fairly important	5	14	11	38
Important	11	31	5	17
Very important	14	39	7	24
No reply given	2	6	1	3

TABLE A41 ATTITUDES TO COMMERCIAL DATABASES BY USERS OF FULL TEXT DATABASES

	used often (n=26)		used seldom (n=24)	
	n	%	n	%
Not important	0	0	2	8
Fairly important	1	4	5	21
Important	9	35	7	29
Very important	14	54	10	42
No reply given	2	8	0	0

APPENDIX VI JOB TITLES
USED BY SURVEY RESPONDENTS

1 PILOT SURVEY

Corporate planning

Business development analyst
Research assistant, group planning
Group economist, Research department
Research information manager
Planning manager
Marketing intelligence director

Finance

Financial director
Manager-financial reporting
Financial services manager
assistant financial controller

Computing

Systems manager
Information services manager
Associate director, group systems
Programmer
EDP manager

Sales & Administration

Admin manager
Purchasing & supply manager
Sales admin
Sales director

Management services

Corporate affairs
Public affairs
External affairs
Management services

2 MAIN SURVEY

Librarian/information officer

Oil	Information Officer
	Assistant information co-ordinator
	Librarian

Pharmaceutical	Librarian/information officer Librarian Library services manager Business intelligence manager Head, biomedical information services Head, central R & D information services Librarian, medical information Librarian, scientific information & project co-ordination Technical & business information analyst
Construction	Librarian, Planning & analysis
Retail	Manager, Marketing information Marketing librarian Manager, Economic information

Corporate planning

Oil	Manager, market planning Head of business development Economic adviser, Planning Chief manager, Corporate development
Pharmaceutical	Planning manager Corporate planning executive. Business development co-ordinator
Electronics	Director, planning
Construction	Manager, Corporate planning Planning programmer
Retail	Director, Business development Executive, Building & development Administration manager, Development

Management services

Oil	Division engineer
Pharmaceutical	Corporate communications Investor relations manager Manager, Corporate & public affairs
Electronics	External relations manager Manager, communications
Construction	Public affairs manager
Retail	Project manager, Group services

Finance

Oil	Taxation manager Finance co-ordinator Financial co-ordinator Credit assessment credit management Service/sales engineer
Pharmaceutical	Controller, finance Director, financial accounting Financial director Director, financial planning Treasurer
Electronics	Business investment manager Financial director
Construction	Financial director Company secretary
Retail	Company secretary Group banking manager Group financial controller

Marketing

Oil	Market analyst Marketing projects & research co-ordinator Group marketing director Marketing services & planning manager
Pharmaceutical	Marketing director Marketing services executive Marketing controller
Electronics	Director, sales & marketing Sales promotion manager Strategic marketing manager Marketing and sales operations manager Marketing co-ordinator Sales office manager
Construction	Business development executive , Sales & marketing Marketing manager Director, marketing
Retail	Marketing manager Marketing executive

Systems

Oil	Information centre manager, Promotion, training & awareness Group information systems manager PC support manager Manager, systems & reports, Computer services manager
Electronics	IT manager Director, information services Computer services administrator DP manager
Construction	Systems manager DP manager
Retail	IT executive Systems development manager DP controller Database analyst Systems manager

APPENDIX VII COMMERCIAL DATABASES IN USE

	O	P	E	C	R	Total
BIBLIOGRAPHIC DATABASES						
Blaise	1	6	0	0	0	7
Datastar	6	19	3	0	0	28
Dialog	11	17	2	1	1	32
Pergamon Infoline	5	14	1	1	1	22
COMPANY INFORMATION DATABASES						
Dataline	1	0	0	2	0	3
Dun & Bradstreet	13	18	8	10	5	54
ICC	7	16	3	2	1	29
Jordanwatch	5	13	1	1	1	21
McCarthy Online	6	5	0	1	1	13
FINANCIAL DATABASES						
Datastream	0	5	0	1	0	6
Dow Jones	4	1	0	1	1	7
Telerate	4	2	0	1	1	8
Reuters	14	10	1	5	5	35
Topic	3	1	3	0	3	10
FULL-TEXT DATABASES						
Magic	0	1	1	2	0	3
Newsline	2	2	1	0	0	5
Nexis	4	4	0	0	0	8
Textline	11	10	3	2	2	28
World reporter	3	10	1	3	0	17

Key

O	Oil
P	Pharmaceutical
E	Electronics
C	Construction
R	Retail

APPENDIX VIII SUPPLEMENT TO LITERATURE SURVEY

Lester and Waters' work on environmental scanning (1989) appeared shortly after the completion of this thesis and is summarised here because of its relevance to the research. The report is in two parts, the first comprising a study of environmental scanning within the corporate planning departments of selected British companies and the second a review of the literature on environmental scanning, leading to some recommendations for the future role of librarians and information scientists in the process of providing executives with usable information for strategic decision-making.

In part A, the results of the empirical study are presented. From a series of in-depth interviews with planning executives in seven large companies known to be at the 'leading-edge' in corporate planning, Lester and Waters found only one example of a separate environmental scanning policy unit. In the other companies, environmental scanning was carried out on a more informal basis alongside the other activities of the corporate planning department. None of the companies had central in-house libraries and the survey found libraries often viewed as 'tedious, time-consuming and frustrating to use'. As in earlier surveys, commercial market information was regarded as the most important area, with newspapers and journals the main sources of information that was

publicly available. Social and cultural information, though collected, was little used. Online services were widely available, with corporate planning departments in most cases the company's heaviest user and Textline the most popular database. More widespread use of online services was felt to be inhibited, not by cost, but by complications of language and access and by a general lack of awareness of services available.

In part B, Lester presents a review of recent literature on environmental scanning. This includes an appendix giving a detailed study of fifteen surveys published over the last ten years. To the studies described in chapter 2 of this thesis, should be added surveys of large US companies by O'Connell and Zimmerman (1979), Kobrin, Basek, Blank and La Palombara (1980), Kennedy (1984), Klein and Linneman (1984), and Engledow and Lenz' in-depth study of the environmental analysis function within ten leading North American firms (Engledow and Lenz, 1985; Lenz and Engledow, 1986).

Arising from his study of the literature of this field, Lester presents a role for the librarian / information officer which differs fundamentally from that put forward by White and Wilson (1986, 1988) following the Sheffield University project (see p28). Where White and Wilson recommend the development of the 'information provider' as a 'trusted source' cultivating personal

contact with managers and developing a good understanding of his company's business, Lester argues that this is a task to be left to the skilled 'knowledge worker' - the corporate planner or consultant - who has the necessary detailed knowledge of the business. Drawing especially on the work of Taylor (1986), he sees the librarian's task as the first stage in the 'value-adding process', organising, structuring and making accessible the complex sources of business information, but leaving to others the later stages of analysis, judgement and decision-making.

As noted in chapter 2 (p26), management literature has so far paid little attention to the contribution of the librarian/information officer to the process of environmental scanning and within the wider context of information management. In defining a particular role for the librarian within the business organization, Lester provides an interesting basis for more widespread debate on this issue.

BIBLIOGRAPHY

Aguilar, F.J. (1967) Scanning the business environment. New York, Macmillan.

Allen, M.J. & Ward, S.E. (1985) Expanding information functions and horizons. *Aslib proceedings*, 37(2), 57-71

Amara, R. & Lipinski, A.J. (1983) Business planning for an uncertain future. Pergamon.

Andrews, D. & Kent, J. (1986) The hidden manager: communication technology and information networks in business organizations. Taylor Graham.

Ansoff, H.I. (1968) Corporate strategy. Penguin.

Ansoff, H.I. (1984) Implanting strategic management. Prentice-Hall.

Ashford, J.H. (1987) Information for the City: a role for free text systems. *Aslib proceedings*, 39 (11/12), 327-336

Aylward, M. (1982) To charge or not to charge - who pays for the information? *Aslib proceedings*, 34 (2), 106-112

Bakewell, K.G.B. (1984) How to organise information. Gower.

Bakewell, K.[G.B.] & Roper, V.de P. (1984) Business information services and public libraries. Liverpool Polytechnic, School of Librarianship and Information Studies (British Library R & D report 5805).

Bentley, T.J. (1980) Defining management's decision-making information needs. Ph.D. thesis. Loughborough University of Technology.

Bentley, T.J. (1981) Making information systems work. Macmillan.

Bhatty, E.F. (1981) Corporate planning in medium-sized companies in the United Kingdom. *Long range planning*, 14, 60-72

Birks, C.I. (1978) Information services in the marketplace. British Library (British Library R & D report 5430).

Blagden, J. (1980a) Do managers read? Cranfield Institute of Technology Press and British Instiute of Management.

Blagden, J. (1980b) Do we really need libraries? Bingley.

Blick, A.R. (1980) Matching resource to service in an information unit. *Aslib proceedings*, 32 (10), 387-401

Blois, K.J. (1980) The manufacturing/marketing orientation and its information needs. *European journal of marketing*, 14 (5/6), 354-364

British Library (1982) Business information: the role of the British Library. British Library, Working group on business information.

Brooks, M. (1988) Business use of information services. Aslib proceedings, 40 (10), 273-5

Business information review. Headland Press. Quarterly.

Campbell, M.J. (1981) Business information services. Bingley. 2nd ed.

Capital Planning Information (1982) Information and the small manufacturing firm: report of a study of information use and needs in small manufacturing firms in the UK. Capital Planning Information.

Capital Planning Information (1983) Business databases in the UK: a preliminary survey. Capital Planning Information (British Library R & D report 5766)

Capital Planning Information (1985) Retailing and services: information use and needs in small retail and service firms in the UK. Capital Planning Information (British Library R & D report 5835).

Carter, M.P. (1981) An economic appraisal of management information. Ph.D thesis. University of Keele.

Carter, M.P. (1983) Determining information needs. *Management decision*, 21 (4), 45-51

Cronin, B. (1981) Assessing user needs. *Aslib proceedings*, 33 (2), 37-47

Cronin, B. ed. (1985) Information management: from strategies to action. Aslib.

Cropley, J. (1986) Towards the paperless business library: from print to online business information. *Business information review*, 2 (4), 3-9.

Culnan, M.J. (1980) Organizational information flows and the industrial library. Ph.D thesis. University of California.

Cyert, R.M. & March, J.G. (1963) A behavioral theory of the firm. Prentice-Hall.

Davenport, L. & Cronin, B. (1987) Marketing electronic information. *Online review*, 11 (1), 39-47.

Dearden, J. (1966) Myth of real-time management information. *Harvard business review*, 44, May-June, 123-132.

Dearden, J. (1983) Will the computer change the job of top management? *Sloan management review*, Fall, 57-60.

Dew, R.B & Gee, K.P. (1973) Management control and information: studies in the use of control information by middle management in manufacturing companies. Macmillan.

Diebold, J. (1984) Managing information: the challenge and the opportunity. Amacon.

Diffenbach, J. (1983) Corporate environmental analysis in large US corporations. *Long range planning*, 16 (3), 107-116.

Directory of online databases. Cuadra Associates. Quarterly.

Duckitt, P. (1984) The information intermediary today and tomorrow. *Aslib proceedings*, 36(2), 79-86.

Dutton, B.G. (1986) Introducing information technology: experiences of a large industrial unit. *Aslib proceedings*, 38 (11/12), 399-410.

Dutton, B.G. (1989) End-user searching - what are the implications? *Aslib proceedings*, 41 (4), 149-156.

East, H. (1986) Non-profit organizations in the UK online database industry. *Aslib proceedings*, 38 (9), 327-334.

Eckersley, J.H. & Rennie, J.S. (1984) Datastream: the use of a business databank. *Journal of information science*, 8, 171-180.

Education & Science, Dept. of (1982) The future development of libraries and information services. Dept. of Education & Science, Office of Arts and Libraries (Library information series, 12).

Engledow, J.L. & Lenz, R.T. (1985) Whatever happened to environmental analysis? *Long range planning* 18 (2), 93-106.

Ewusi-Mensah, K. (1981) The external organizational environment and its impact on management information systems. *Accounting, organizations and services*, 6 (4), 301-316.

Fahey, L. & King, W.L. (1977) Environmental scanning for corporate planning. *Business horizons*, 29, 61-71.

Fahey, L., King, W.L. & Narayananan, V.K. (1981) Environmental scanning and forecasting in strategic planning - the state of the art. *Long range planning*, 14, 32-39.

Firth, R.J. (1983) Managing viewdata systems. NCC.

Fletcher, K.P. (1982) Marketing information systems: a lost opportunity, in Marketing: bridging the gap between theory and practice, ed. M.J.Thomas (Proceedings of the Marketing Education Group, 15th annual conference). University of Lancaster.

Fletcher, K.P. (1983) Information systems in British industry. *Management decision*, 21 (2), 25-36.

Flowerdew, A.D.J. & Whitehead, C.M.E. (1974) Cost-effectiveness and cost benefit analysis in information science. London School of Economics (OSTI report 5205).

Flowerdew, A.D.J., Oldman, C.M. & Whitehead, C.M.E. (1984) The pricing and provision of information. British Library. (LIR report 20).

Foster, A. (1981) Which database? An evaluative guide to online bibliographic databases in business and social sciences. Headland Press.

Gale, A.P. (1982) Database-aided research. *Journal of accountancy*, January, 73.

Gent, A. (1987) Reading habits of managers and the readabililty of financial information in newspapers. M.Sc thesis. City University, Dept. of Information Science.

Goold, M. & Campbell, A. (1987) Strategies and styles: the role of the centre in managing diversified corporations. Basil Blackwell.

Grant, D. (1987) Retail industry: how to find out. *Business information review*, 3 (3), 3-10.

Groeger, R.G. (1974) Information services for the construction industry. *Aslib proceedings*, 26 (1), 2-8.

Hambrick, D.C. (1981) Specialization of environmental scanning activities among upper level executives. *Journal of management studies*, 18 (3), 300-319.

Harman, J. (1986) Reuters: a survey of end-user searching. *Aslib proceedings*, 38 (1), 35-42.

Harris, K., Nicholas, D. & Erbach, G. (1986) Online use and end-users in media and advertising: an overview. *Aslib proceedings*, 38 (11/12), 389-397.

Haygarth Jackson, A.R. (1981) Pharmaceuticals - an information based industry. *Aslib proceedings*, 39 (3), 75-86.

Hill, M.W. (1985) Information for middle management decision making. *Information services and use*, 5, 21-36.

Hills, P. ed. (1980) The future of the printed word: the impact and implications of the new communications technology. Frances Pinter.

Hills, P. ed. (1982) Trends in information transfer. Frances Pinter.

Hirsch, P.M. (1975) Organizational effectiveness and the institutional environment. *Administrative science quarterly*, 20, 327-344.

Hirscheim, R.A. (1983) Managing the growth of electronic office information systems. *Long range planning*, 16 (6), 59-67

Horne, J.H. & Lupton, T. (1965) The work activities of middle managers: an exploratory study. *Journal of management studies*, 2 (1), 14-23.

Horton, F.W. Jr. (1987) The impact of information management on corporate cultures. *Aslib proceedings*, 39 (9), 267-274.

Houghton, B. & Wisdom, J.C. (1981) Non-bibliographic on-line databases: an investigation into their uses within the fields of economics and business studies. British Library (British Library R & D report 5620).

Hussey, D.E. (1984) Strategic management: lessons for success and failure. *Long range planning*, 17 (1), 43-53.

Hyde, M. (1988) Library and information services to business and industry: study on levels of service, related costs and charging systems. British Library (British Library research paper, 48).

Information for industry: the next ten years (1984) Proceedings of a conference organised by the British Library Research & Development Dept. in association with the Technical Change Centre (British Library R & D report 5802).

Information Technology Advisory Panel (1983) Making a business of information. HMSO.

Jain, S.C. (1984) Environmental scanning in US corporations. *Long range planning*, 17 (2), 117-128.

Jemison, D.B. (1984) The importance of boundary spanning roles in strategic decision-making. *Journal of management studies*, 21 (2), 131-152.

Jobber, D. (1977) Marketing information systems in United States and British industry. *Management decision*, 15 (2), 197-304.

Jobber, D. & Rainbow, C. (1977) A study of the development and implementation of marketing information systems in British industry. *Journal of the Market Research Society*, 19 (2), 104-111.

Johnson, R.A. & others (1973) The theory and management of systems. 3rd ed. McGraw-Hill.

Johnston, J. (1975) A survey of construction industry libraries. *Aslib proceedings*, 27 (10), 401-413.

Keegan, W.J. (1967) Scanning the international business environment: a study of the information acquisition process. Doctor of Business Administration thesis. Harvard University.

Keegan, W.J. (1968) The acquisition of global information. *Management review*, June, 54-56.

Keegan, W.J. (1974) Multinational scanning: a study of the information sources utilized by headquarters executives in multi-national companies. *Administrative science quarterly*, 19, 411-421.

Kefalas, A. & Schoderbek, P.P. (1973) Scanning the business environment: some empirical results. *Decision sciences*, 4, 63-74.

Kelley, W.T. (1968) Marketing intelligence. Staples Press.

Kennedy, C.R. (1984) The external environment-strategic planning interface: US multinational corporate practices in the 1980s. *Journal of international business studies*, Fall, 99-108.

King, W.R. & Cleland, D.I. (1974) Environmental information systems for strategic marketing planning. *Journal of marketing*, 38, 35-40.

Klein, H.E. & Linneman, R.E. (1984) Environmental assessment: an international study of corporate practice. *Journal of business strategy*, 66-75.

Kobrin, S.J., Basek, J., Blank, S. & La Palombara, J. (1980) The assessment and evaluation of noneconomic environments by American firms. *Journal of international business studies*, Spring-Summer, 32-47.

Lancaster, F.W. (1971) Toward paperless information systems. Academic Press.

Lenz, R.T. & Engledow, J.L. (1986) Environmental analysis units and strategic decision making: a field study of selected "leading-edge" corporations. *Strategic management journal*, 7, 69-89

Leslie, G. (1986) Decision support systems: learning to apply computers. *Aslib proceedings*, 38 (9), 275-283.

Lester, R. (1984) User education in the on-line age. *Aslib proceedings*, 36(2), 96-111.

Lester, R., Ettinger, A. & Wootliff, V. (1984) Teaching business executives about online databases and databanks. 7th Online information meeting, London, 6-8 December, 1983. Learned Information.

Lester, R. & Waters, J. (1989) Environmental scanning and business strategy. British Library. (Library and information research report, 75).

Lewis, M.F. (1982) Sources and uses of external information for smaller firms. Ph.D.thesis. University of Arkansas.

Library Association (1982) The impact of new technology on libraries and information centres. Library Association.

Maher, P. (1983) A world of information at your fingertips: plugging into online databases. *Business marketing*, Oct., 62-6, 85.

Martyn, J. (1985) Factual databases. *Aslib proceedings*, 37 (5), 231-8.

Martyn, J. & Flowerdew, A.D.J. (1982) The economics of information. British Library (LIR report 17).

Methlie, L.B. & Tverstøl, A.M. (1982) External information services: a survey of behavioural aspects of demand. *Information & management*, 5, 269-277.

Mintzberg, H. (1973) The nature of managerial work. Harper & Row.

Moore, N. ed. (1981) On-line information in public libraries: a review of recent British research. British Library (British Library R & D report 5648).

Moores, P. (1981) Information users' changing expectations and needs. *Aslib proceedings*, 33 (3), 83-92.

Morden, A.R. (1985) Management information systems: role and policy in an organizational context. *Management decision*, 23 (2), 52-64.

Naughton, J. (1974) Management information systems. Open University Press (T242, unit 10).

Nicholas, D., Erbach, G. & Harris, K. (1987a) End-users: threat, challenge or myth? *Aslib proceedings*, 39 (11/12), 337-344.

Nicholas, D, Erbach, G. & Harris, K. (1987b) Online: views on costs and cost-effectiveness. *Journal of information science*, 13, 109-115.

Nicholas, D., Harris, K. & Erbach, G. (1987c) Online searching: its impact on information users. Mansell Publishing (British Library R & D report 5944).

Nolan, R.L. (1973) Computer databases: the future is now. *Harvard business review*, Sep-Oct, 98-114.

Nonaka, I. & Nicosia, F.M. (1979) Marketing management, its environment, and information processing: a problem of organizational design. *Journal of business research*, 7 (4), 277-300.

Norris, J. (1985) The information unit's contribution to industry. *Information & library manager*, 4 (3), 60-71.

Norton, R.A. (1985) The impact of online services on business information values. *Business information review*, 2 (2), 30-36.

O'Connell, J.J. & Zimmerman, J.W. (1979) Scanning the international environment. *California management review*, 22 (2), 15-23.

Petts, C. & Rennie, J. (1986) The provision of business information and market research services by Research Associations. *Business information review*, 2 (3), 3-19.

Pfeffer, J. & Salancik, G.R. (1978) The external control of organizations: a resource dependence perspective. Harper & Row.

Piercy, N. (1980) Marketing information systems. *Quarterly review of marketing*, Oct., 16-24.

Piercy, N. (1981) Marketing information bridging the quicksand between technology and decision-making. *Quarterly review of marketing*, Oct., 1-15.

Piercy, N. & Evans, M. (1983) Managing marketing information. Croom Helm.

Porter, M.E. (1980) Competitive strategy. Free Press.

Porter, M.E. & Millar, V.A. (1985) How information gives you competitive edge. *Harvard business review*, July-August, 149-160.

Reinhardt. W.A. (1984) An early warning system for strategic planning. *Long range planning*, 17 (5), 25-34.

Rhyne, L.C. (1984) Strategic information: the key to effective planning. Managerial planning, Jan/Feb, 4-10.

Rhyne, L.C. (1985) The relationship of information usage characteristics to planning system sophistication: an empirical examination. *Strategic management journal*, 6, 319-337.

Roberts, N. & Clarke, D. (1987a) Information education in business and management schools: a review from the perspective of schools of librarianship and information studies. University of Sheffield, Dept. of Information Studies, Consultancy and Research Unit (CRUS working paper, 10) (British Library R & D report 5943).

Roberts, N & Clarke, D. (1987b) The treatment of information issues and concepts in management and organizational literatures. University of Sheffield, Dept of Information Studies, Consultancy and Research Unit (CRUS occasional paper, 15).

Roberts, N. & Clarke, D. (1988) Information analysis and acquisition: case studies of manufacturing firms. University of Sheffield, Dept. of Information Studies, Consultancy and Research Unit (CRUS occasional paper, 17) (British Library R & D report 5960).

Roberts, N. & Clifford, B. (1986) Regional variations in the demand and supply of business information: a study of manufacturing firms. Centre for Research on User Studies and British Library (CRUS Occasional papers, 13).

Ryan, F. (1988) Achieving corporate goals via online information. *Business information review*, 4 (3), 3-14.

Schoderbek, C.G., Schoderbek, P.P. & Kefalas, A.G. (1980) Management systems: conceptual considerations. Business Publications.

Seddon, G. (1984) Information retrieval as the kernel of office automation. *Journal of information science*, 8 (2), 67-80.

Shoolbred, M.A. (1987) Problems in the supply and use of information in the United Kingdom construction industry, with special reference to the impact of information technology. M.Phil. thesis. CNAA. City of Birmingham Polytechnic.

Sigel, E. (1983) The future of videotext. Knowledge industry publications.

Sigel, E. (1983) Is videotext vendible? *Datamation*, July, 209-222.

Simon, H.A. (1977) The new science of management decision. Prentice-Hall. Rev. ed.

Singleton, A. (1982) Information technology in industrial information services. University of Leicester, Primary Communications Research Centre.

Slater, M (1980) The neglected resource: non-usage of library information services in industry and commerce. Aslib.

Slater, M. (1984a) Non-use of library information resources at the workplace. Aslib.

Slater, M. (1984b) Problems at work. *Aslib proceedings*, 36 (4), 201-212.

Smart, C. & Vertinsky, I. (1984) Strategy and the environment: a study of corporate responses to crises. *Strategic management journal*, 5, 199-213.

Stewart, R. (1988) Managers and their jobs. Macmillan. 2nd ed.

Stonier, T. (1983) The wealth of information: a profile of the post-industrial economy. Thames Methuen.

Stubbart, C. (1982) Are environmental scanning units effective? *Long range planning*, 15 (3), 139-145.

Sullivan, C. & Oliver, D. (1981) The impact of Prestel on public library reference activities. Aslib. (British Library R & D report 5654).

Synott, W.R & Gruber, W.H. (1981) Information resource management: opportunities and strategies for the 1980s. Wiley.

Taylor, P.J. & Cronin, B. (1983) Information management research in Europe: proceedings of EURIMIS conference, Versailles. Aslib.

Taylor, R.S. (1986) Value-added processes in information systems. Ablex.

Technical Change Centre (1983) Information demand and supply in British industry, 1977-83. British Library (LIR report, 23).

Tenopir, C. (1985) Systems for end-users: are there end users for the systems? *Library journal*, June, 40-41.

Thomas, P.S. (1980) Environmental scanning: the state of the art. *Long range planning*, 13, 20-25.

Times 1000, 1985/86. Times Books.

Tricker, R.I. & Boland, R.J. (1982) Management information and control systems. John Wiley. 2nd ed.

Trott, F. & Martyn, J. (1986) An information service for small firms from a public library base. *Aslib proceedings*, 38 (2), p43-49.

University of Newcastle-upon-Tyne, Centre for Urban and Regional Development Studies (1983) The stimulation of economic activity in local enterprise through provision of technical and commercial information. Final report.

Vickers, P. (1984a) Information management: a practical view. *Aslib proceedings*, 36 (6), 245-252.

Vickers, P. (1984b) Overcoming information anarchy. *Information management journal*, Autumn/Winter, 22-25.

Vickers, P. (1984c) Promoting the concept of information management within organizations. *Journal of information science*, 9, 123-127.

Webb, S.P. (1984) Using commercial databases online. *Aslib proceedings*, 36 (10), 393-400.

White, D.A. (1986) Information use and needs in manufacturing organizations: organizational factors in information behaviour. *International journal of information management*, 6, 157-170.

White, D.A. & Wilson, T.D. (1988) Information needs in industry: a case study approach. University of Sheffield, Consultancy and Research Unit (CRUS occasional paper, 16) (British Library R & D report 5954).

White, M.S. (1980) Information for industry-the role of the information broker. *Aslib proceedings*, 32 (2), 82-86.

White, M.S. (1981) Profit from information: a guide to the establishment, operation and use of an information consultancy. Deutsch.

Wildavsky, A. (1983) Information as an organizational problem. *Journal of management studies*, 20 (1), 29-40

Wilkin, A. (1974) Some comments on the information broker and the technological gatekeeper. *Aslib proceedings*, 26 (12), 7-13.

Wilkinson, J.W. (1974) Specifying management's information needs. *Cost & management*, Sep/Oct., 7-13.

Willis, C (1986) Online business databases: an investigation into their uses and users. *Business information review*, 3 (2), 10-23.

Wilson, T.D. (1981) On user studies and information needs. *Journal of documentation*, 37 (1), 3-15.

Wilson, T.[D.] (1987) Information for business: the business of information. *Aslib proceedings*, 39 (10), 275-9.

Withers, H. (1985) New technology and the provision of business information in UK company libraries. *Business information review*, 1 (4), 30-34.

Withey, R. (1986) How managers use online information. *Business information review*, 3 (12), 12-19.

Woodling, G. (1986) Corporate intelligence networks. *Aslib proceedings*, 38 (9), 285-295.