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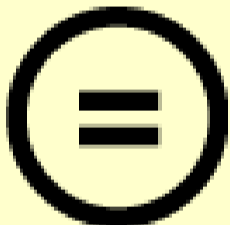
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Scholarly Communication, the Information Chain and Technology: Analyses and Reflexions

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by

Neil Jacobs

Thesis submitted in partial fulfilment of the requirements for the award of
Ph.D., Department of Information Science, Loughborough University
2001.

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Scholarly Communication, the Information Chain and Technology: Analyses and Reflexions

Abstract

It is no longer easy to adopt deterministic explanations of scholarly communication, technology or the information chain. Complex and reflexive relations have built up between the substantive and methodological literatures relevant to these topics. This thesis aims to explore these relations with reference to two sets of interviews, one with academic researchers and the other with information professionals. These interviews were conducted in 1998-9 during the FIDDO Project, a part of the UK Joint Information Systems Committee 'Electronic Libraries Programme'.

Two major theoretical perspectives are employed to support two analytic methodologies. The first is social constructivism, which is represented methodologically in the thesis by discourse analysis. The second is actor-network theory, which is represented methodologically by co-word analysis. Both of these approaches are engaged in questions of relativism and realism in social explanation.

The implementation of each of the methodologies involves innovative moves. The discourse analysis is focused on personal deixis (self-reference) located by pronoun-use, and on interest management. The co-word analysis is adapted from a scientometric technique and supplemented by the use of categorical definitions of the three topics. Each methodology is employed to analyse both sets of interviews. The four resulting sets of findings are presented in terms of the boundaries apparent between the three topical concepts.

The boundaries between scholarly communication, technology and the information chain are found to vary, for example according to the identities of the interviewees responsible for the data. They also vary according to the methodology employed. Discourse analysis

of interviews with information professionals suggests that the idea of technology is deployed as a dual repertoire, consisting of empowerment and automation, and that the pattern of this deployment is one constituent of the contested boundaries between the three topics. Co-word analysis of the same interviews suggests that an important focus of the boundaries is around the idea of electronic journals. Discourse analysis of interviews with academic researchers also reveals use of the dual technology repertoire, but in addition suggests that the category of formal scholarly communication acts to legitimate the interests of researchers. Co-word analysis of the same interviews suggests that a number of models of document access were in play, including those based on the library, on paper and on documents. The implications of these substantive analyses include that studies based on 'user needs' or the 'impact of technology' could benefit from an analysis of how such topics are constructed in particular accounts.

Finally, the question is addressed as to the extent that the results of the discourse and the co-word analyses (of the same data) are compatible so that they can be meaningfully synthesised. That is, do the two approaches give rise to outcomes that have similar epistemological status? The question is answered 'empirically' with reference to the issue of reflexivity as it is configured in the two approaches, and it is confirmed that the two types of outcome are not compatible due to profound differences in the positions adopted by their respective informing theories. The methodological implications of this include that those engaged in relativist research practice need to be aware the ways in which epistemological and reflexive issues are relevant to their actions.

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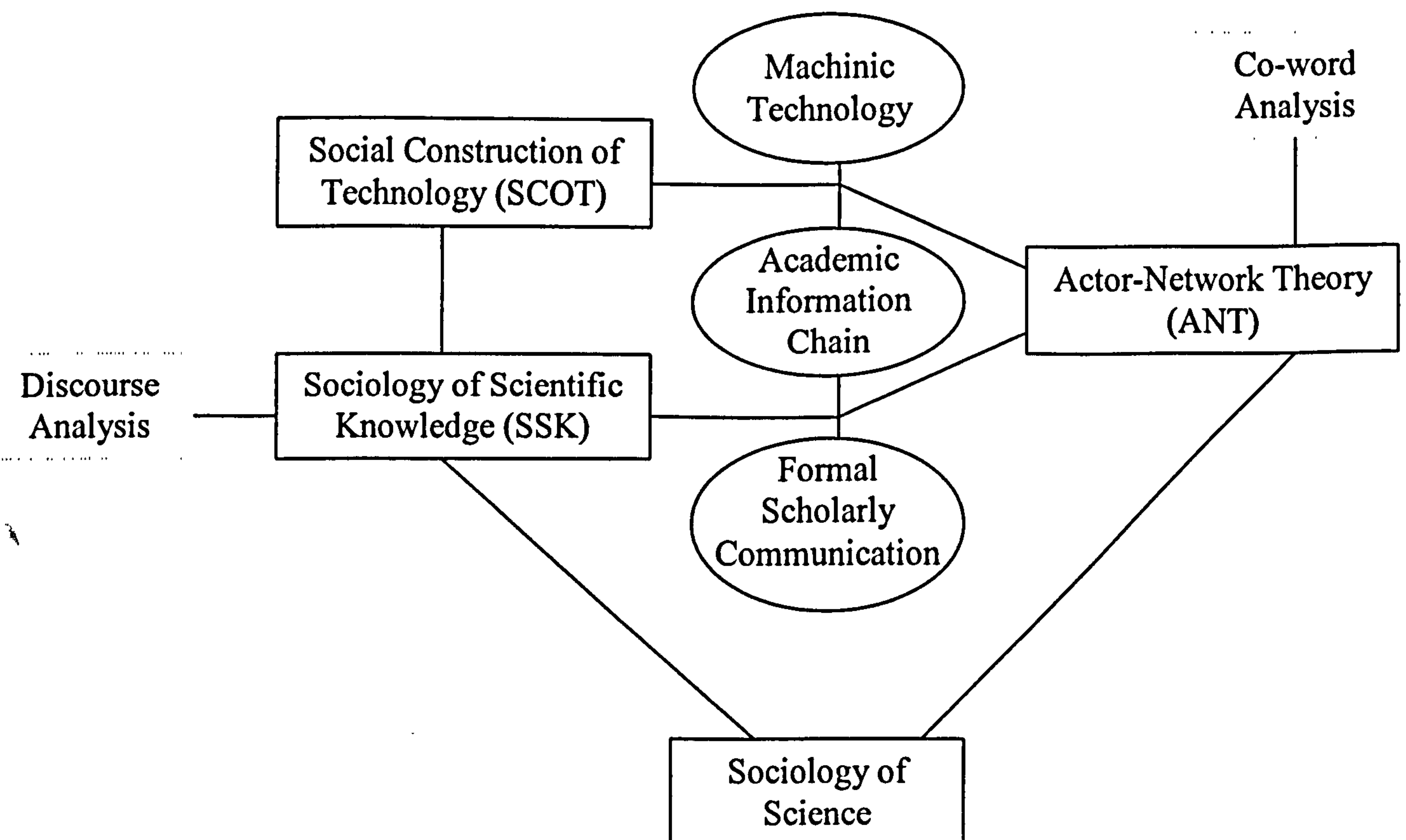
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Chapter One - Setting the scene

Introduction

The title of this project is 'Scholarly Communication, the Information Chain and Technology: Analyses and Reflexions'. It is concerned with certain substantive and methodological issues relevant to (the study of) formal academic or research communication. The project is therefore made up of several related themes. For the purposes of this introduction (and therefore for the project as a whole), I shall refer to Figure 1 in discussing these themes and relations.

Figure 1: The conceptual ingredients



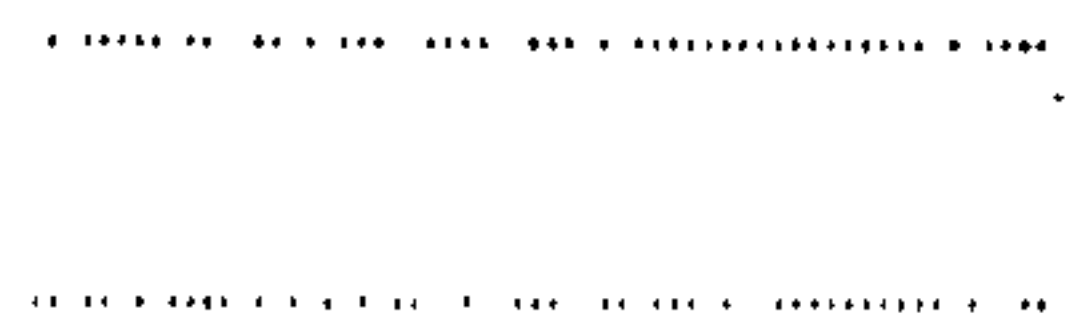
Key to Figure 1:



Topic



Theoretical approach



Methodological approach

Figure 1 is a heuristic device designed to aid readers. Specific entities and relations (and absences thereof) implied in it are contestable.

The objectives of this chapter are to introduce these elements, to discuss the relations between them and to note how these inform this study. To do this, I shall treat both methodology and topic as derivative of theory. That is to say, in order to arrive at the two elements of empirical work (of which there are perhaps¹ examples in this study), topic and methodology, I shall begin with theory. The details of the two methodological approaches in Figure 1 are deferred until Chapters Two and Three. The fact that both methodologies and topics are derivable from a collection of theory has certain reflexive implications explored a little toward the end of this chapter and in more detail later in the study.

Theoretical approaches

Although critical of each other, the theoretical approaches described here are, at this point, offered as alternatives. This is because, as will become clear in Chapter Ten, they themselves can be considered to be topics for this study.

1. The status of these examples as 'empirical' is a topic of Chapter Ten.

Sociology of Science

The idea and conduct of academic science (in its widest sense) is relevant to this project in a number of ways. Firstly, scholarly communication is both an activity of researchers and a topic of this project. Secondly, because science and scientists have been studied over a long period, the project benefits from being linked with an established research tradition. Thirdly, the study of academic research has resulted in innovative and interesting conceptual and methodological approaches. Fourthly, the inevitable reflexivity involved in researching research has been addressed by many in the field of science studies.

Although still an active research area (Meadows 1998), the sociology of science is perhaps most associated with the work of Robert Merton and his associates (Merton 1973). This work addressed the practice, though not the content, of science from a classical sociological perspective influenced heavily by Parsonian structural-functionalism. That is to say, the social structure of science was a reflection of its functions, and was regulated by a number of social norms and reward structures. Normative rules are not necessarily those most commonly followed, but are those to which people are expected to adhere. In Merton's work, four basic norms were identified in the practice of scientists. These were:

1. universalism - scientific work is assessed on the basis of publicly available and impersonal criteria;
2. communality - such work is therefore itself publicly available;
3. disinterestedness - there is no personal stake in such work for the scientist;
4. organised scepticism - such work is continually subject to critical scrutiny.

There has been much debate over the adequacy of these norms in describing the practices, goals and expectations of scientists. Examples of practical deviations from each are easily found, some of which can be argued to have normative status themselves. For example, personal interest appears to have played, and been expected to play, a major

role in the eventual acceptance of some scientific ideas, especially if those ideas were in some way radical or challenging to the then current orthodoxy. Nevertheless, so long as classical sociological analysis remained the dominant school, such debates remained intra-paradigmatic; they were not corrosive to the overall approach. The well-known work of Kuhn (1970) is widely cited as that which - perhaps reflexively - divides such approaches from more recent developments, not only in science studies but in sociology and epistemology more generally.

Sociology of Science as topic

The relations between the sociology of science and scholarly communication and the information chain are in one sense obvious. Given that one of the Mertonian norms of science was communality, then the effective communication of the results of scientific (and, indeed, other academic) work was a requirement. The way this was organised was seen as the result of such normative constraints, along with technical and economic ones. Whereas activities relating to the former might be considered to be formal scholarly communication, those relating to the latter could be construed as the academic information chain. For example, citation patterns were, and often still are, seen as indicators reflecting scholarly communication, whereas features of the information chain are more usually surveyed in terms of, for example, market arrangements and technological innovation. That is, it is more usual to find citation patterns explained by reference to matters intrinsic to research, for example, differences in the demands of sciences, social sciences and humanities (Price 1970), rather than by economic or technological matters. On the other hand, it is more usual to find economic and technological matters, broadly conceived, explained in terms of each other (Feather 1991, Weintraub 1999, Day et al 1993) rather than by reference to scholarly imperatives. From the Mertonian perspective, then, the distinction between scholarly communication and the information chain marks the boundary between that which is subject to scientific (or similar) norms and that which is not; that which imperfectly translates these norms - especially that of communality - into practice. Thus, the object of the sociology of

science is idealised and thereby made inaccessible. The norms by which researchers communicate are never available to the analyst except as refracted through the imperfect lens of the information chain. The search for direct access to scientific norms via (for example) citation patterns demands that such patterns are interpreted in particular ways that specifically exclude technological and economic considerations. These interpretations have been subject to criticism from the perspectives of both the sociology of scientific knowledge (SSK) and, relatedly, actor-network theory (ANT), as a part of a more general critique that has cast as problematic the fact that the classical sociological approach explicitly excludes the content of scientific knowledge from its scope.

Sociology of Scientific Knowledge

Introduction

The history of the sociology of scientific knowledge (SSK) as generally told goes as follows (Woolgar and Ashmore 1988). SSK was configured as a reaction to the approach known as the sociology of science, wherein the reward structures and social norms and contexts of scientists were studied, but the content of science itself, the knowledge, was unexamined. It was assumed that, because the scientists were the experts, only they could comment on scientific knowledge. The critique of this view, which became known as SSK, was enabled by the influence of relativism (see below) on social science, following Kuhn (1970). Bloor's 'strong programme' (1976) was highly influential in this critique, introducing the notion of symmetry in explanation. In this case, the symmetry was between 'true' and 'false' beliefs; the role of the sociologist was to use the same types of explanation for how each came to be believed at certain times and in certain places. Bloor's programme was operationalised by Collins (1981), who described a three-stage Empirical Programme of Relativism, which was to become highly influential in the emergence of SCOT (see below), but which, as it was published, related specifically to the conduct and resolution of scientific controversy. In its most basic guise, the three stages are:

1. Experiments do not have self-evidencing results (a naïve realist stance is unsustainable), so that there is flexibility in interpreting the outcomes of experiments; interpretative flexibility.
2. Consensus is generally reached on the 'truth' of the experiment, and this consensus is achieved by the action of social and rhetorical moves; closure mechanism.
3. The closure mechanisms are related to wider social structures and processes.

Collins argues that if these three stages were to be followed through in a single study, then the social construction of scientific knowledge would have been thoroughly demonstrated. Of course (and as Bloor had previously pointed out without taking the issue much further), if scientific knowledge could be described as socially constructed, then so could SSK. The related concerns of relativism and reflexivity are inherent in the SSK position.

Relativism

One strong discourse with which this study is engaged is that of radical relativism. Despite one of the central tenets of such a discourse being that concepts are the outcomes rather than the causes of explanations, there now follows a somewhat standard explanation of relativism (with references) that aims to establish it as a stable concept for the rest of this study. That is to say, this chapter aims to take relativism as 'topic' in order that later chapters can take it as 'resource' (Halfpenny 1988, 1989, Potter and McKinlay 1989, Zimmerman and Pollner 1971). That such a separation is impossible may become clear during this study.

Relativism in the social sciences has emerged as a distinctive discourse within the academic texts of post-war anthropology. Initially configured as a reaction to 19th and early 20th century imperialist and functionalist studies of 'primitive cultures', relativists insisted that evaluations of cultural practices could not legitimately be made outside the frames of reference of those practices. More recently, when anthropologists and others have turned their attention to less exotic cultures, relativism has proved useful as a means by which powerful discourses can be discussed without having to make evaluations as to

the truth claims made by them. This has, perhaps, been most evident in work done in SSK such as Bloor (1976) and Collins (1998). Such work is not unchallenged (Gross and Levitt 1994), and there has been some epistemological heavy warfare between relativists and those who consider that scientific knowledge can, by its very nature and practices, make more valid truth claims than other knowledge systems.

One of the inescapable features of relativism is that the social construction of facts and artefacts relates as much to social explanation as to any other form of discourse. It appears difficult, therefore, for relativists to avoid certain charges, notably that their accounts are self-undermining (Hammersley 1993). Halfpenny (1989) has noted that “one cannot relativize one’s own knowledge claims while making them without undermining the point of one’s investigation” (p149). Indeed, some social constructionists such as Pinch and Pinch (1988) have claimed that such reflexivity is ‘debilitating’ for research. On the general point that relativist accounts are self-undermining, Ashmore (1996) has argued that this is a vital aspect of the relativist approach, since it is precisely this that allows the approach to function as a means to discuss otherwise inaccessibly legitimate discourses such as those of the natural sciences or of technology. Similarly, Potter and McKinlay (1989) note that SSK has found the scepticism of relativism essential to avoid ‘going native’. The symmetry of the relativist stance, wherein success and failure (for example, of a scientific truth claim) are not explanations but are the things to be explained, is essential to producing accounts that emphasise that things could always have been otherwise².

Another charge laid at relativists’ doors is that, by denying the possibility of cross-cultural evaluative statements, they render criticism impossible. Sangren (1988) has noted that a realist assumption is useful in social science accounts as it opens a common

2. The quest to avoid charges of overdeterminism can be seen as a rhetorical imperative in the academic disputes on explanation, an imperative to which relativism is configured to conform. Charges of overdetermination can result from technological determinism (Ellul (1964) and many others, critiqued by Winner (1997)), ideological determinism (Graves (1995), critiqued by Abatte (1996)), sociological determinism (Pinch and Bijker

discursive space wherein proponents and critics of claims and accounts can debate. He notes that some relativist positions, particularly those associated with post-modern and critical theory, render their texts in such a way as to make inter-textuality (and therefore scholarly community) impossible. In a similar vein, Hammersley (1993) defends a realist metaphysics, arguing that a criterion for assessing accounts is that of 'beyond reasonable doubt', that relativism implies no rational discussion of alternative views, restricting interaction to political conflict, and that only a realist approach to research can produce reliable results. Foucault has argued (Rabinow 1986) that this state of affairs is historically specific, and Kuhn (1970) and Mulkey (1979) have argued that free discursive spaces are (perhaps Weberian?) ideal types and that scientific knowledge and practice are non-sequential and paradigmatic. I would add that academic discursive spaces are disciplined in the same way as other discourses and that practices such as authoring research texts in conventional, univocal ways are examples of the structuration (Giddens 1984) of such spaces. In seeking to present a realist account of selection and inference in research practice, Halfpenny (1989) (perhaps unintentionally) offers some support to this position, recommending that researchers be "guided by the tacit skills absorbed from their disciplines' traditions" (p150). It is clear that such tacit skills will define what is seen as 'reasonable' (Hammersley 1993) and may thus be seen as an aspect of power (Lukes 1974). The relativist stance is not to seek to avoid such structuring of explanation (which would be futile), but to put all knowledge claims, including its own, on the same footing. Halfpenny (1989) is right when he notes that relativism undermines any claims to truth made in its name, but this does not imply that knowledge and power are indistinguishable, only that they are inseparable. Furthermore, it has been argued (Graves 1995) that the "situated understandings of social actors" are missed by the social realist approach; that such understandings are relevant has been argued by Suchman (1987).

Apart from the philosophical and methodological critiques noted above, relativist explanations have been attacked on both epistemological and ethical grounds. The

(1984), implicitly critiqued by Woolgar (1981)), and humanistic determinism (noted and critiqued by Berg (1998), also implicitly critiqued by Winner (1980)).

epistemological grounds of the attack have tended to be in the form of attempted *reductio ad absurdum* (Kling 1992) or related ‘bottom line’ arguments against ‘thoroughgoing’ relativism (Grint and Woolgar 1992). The ethical grounds of the attack have asserted that denying an *a priori*, apprehensible reality is politically naïve, and that such denials lead to revisionist histories such as those of neo-Nazi groups. Both of these lines of attack have been addressed by Edwards, Ashmore and Potter (1995), by Latour (1988) and by Grint and Woolgar (1997). They note that relativism can be sustained longer than alternative theoretical approaches, and that it should be so sustained because it acts to open discourse rather than to close it down. Ironically addressing the perceived fears of realists about relativism’s apparent lack of grounding, Latour (1988) characterises their arguments as “the sky will fall on our heads if it is not firmly propped up by at least a few pillars much stronger than our weak forces or those of our contingent, local and historical societies” (p.155).

SSK as practice

Although remaining controversial, SSK now has an extensive canon in which the practice and outcomes of science have been to some extent characterised according to the tenets of Bloor’s (1976) ‘strong programme’. Seminal contributions include those by Collins (1998) and Ashmore (1989). I have chosen these to represent a major debate within SSK, rather than to claim that they define the limit of it; other writers such as Knorr Cetina (1996) and Pickering (1995) are also central to the canon.

The work undertaken by Harry Collins and Stephen Yearley at the University of Bath represents what became known as the ‘Bath School’ of SSK. Bath SSK is, unsurprisingly, that which follows most closely Collins’ three-point Empirical Programme of Relativism, described above. For example, Collins (1998) discusses the ways in which what counts as scientific evidence varies between two physics laboratories, one in the USA and one in Italy. His fieldwork techniques draw extensively from ethnography and participant observation and, in keeping with this anthropological

perspective, he defines the variations discovered in terms of differing evidential cultures in the two laboratories. These differences had profound implications for the publishing activities of the two laboratories. Those working in Italy saw scientific quality assurance being at the collective level (the scientific community), and inferences being justifiable earlier from data and at a lower level of statistical significance than did those working in the USA. Hence, members of the Italian group were more ready to publish than those of the American group, who were concerned that their credibility (and, hence, funding) might suffer if they published too early. Collins traced this concern back to the failure of an earlier high-risk American research project, inferring that this had made these US physicists more risk-averse than their Italian colleagues. Comparing this study with the three-point empirical programme, we can see that the experiments carried out in the two laboratories did not have self-evidencing results, that consensus on what the results of the experiments meant was reached by reference to social factors and that eventual closure was related to the wider funding conditions faced by the two laboratories. Theoretically, therefore, Collins is committed to a kind of social realism. That is, whereas the knowledge of the scientists is the topic, the knowledge of the social scientists is not. This is necessary to support the Bath School interpretation of Bloor's (1976) requirement for symmetry in the study of science. That is, the route to 'true' and 'false' scientific beliefs should be studied in the same terms and explained using the same kind of resources. In Collins' work, these resources are the tools of sociology and anthropology.

A major critique of this approach concerns the potentially corrosive effects of relativism on the results of Bath School SSK. That is, if the knowledge of scientists can be explained by reference to social factors, then how is the knowledge of those studying them immune (Ashmore 1989)? And if scientists' published accounts are susceptible to interpretation based on social factors such as 'interests', then how are those of SSK practitioners not so susceptible (Woolgar 1981)? The response from Collins (1998) (and, indeed, from Bloor (1976)) is that such reflexivity is best practised at the level of disciplines, so that the topic of the practices and knowledge of SSK is valid, but not for those practising SSK (at least, not when they are practising SSK). A discipline's construction cannot be its own concern. However, Ashmore (1989) notes that this is a

difficult stance to maintain when specific knowledge claims are made (indeed, in the above example of the physicists, it seems to take the Italians' side). For example, in a study of parapsychology, Collins (1976) discusses what gets to count as a replication of a scientific result. That is, what has to be the same and what has to be different for a study to count as replicating the results of a previous study? In several subsequent studies (Collins 1981), the findings of the parapsychology replication study are to a greater or lesser extent (and that is precisely the issue...) reproduced. The highly reflexive and apparently unavoidable question is how to replicate a research finding relating to how replication is achieved (Ashmore 1989)? More generally, if SSK is not to be a standing refutation of itself, then its knowledge must relate to SSK as much as to any other discipline, and yet if it does then SSK is a standing refutation of itself. This is relativist explanation as a problem.

Questions of explanation as rhetorical form and social practice have been addressed by, among very many others, Woolgar (1981), Woolgar and Pawluch (1985), Latour (1988) and Ashmore (1989). In 1981, Woolgar focused his attention on constructionist accounts in the social science literature. Using SSK as an example, and citing Garfinkel (1967, 1972a) as a source, he argues from an ethnomethodological perspective that explanations that rely on 'interests' (economic interests, social interests and so on) that are deployed in the explanation as separate from the behaviour to be explained do not adequately allow for the indexical relationship between the interests and the behaviour. In a peculiarly circular move, 'interests' are inferred from the behaviour that they are recruited to explain. Woolgar argues that such bootstrapping is probably ubiquitous and inevitable, and that its management is an interesting topic for analysts. In a similar vein, Woolgar and Pawluch (1985) also concentrate on the construction of constructionist accounts, noting that one tactic used for such management is what they call 'ontological gerrymandering', or the fixing of background boundaries in order to enable foreground explanation. Ashmore (1989) takes the management of explanation and reflexivity as both his topic and resource, displaying a thorough undermining of the possibility of explanations that are not self-contradictory. In one attempt to develop a thoroughly constructionist theory of explanation, Latour (1988) takes issue with "meta-reflexivity"

and “methodological accounting tricks” such as those found in Ashmore’s text. In a call that would appear to provide supporting evidence for Sangren’s (1988) criticism of relativist and post-modern explanatory practices, Latour argues for a move away from generalised theory and toward the use of local and “throwaway” explanations.

The reflexive ‘problem’, as outlined above is, however, only a problem if it is assumed that saying something about how a knowledge claim comes to be believed is the same as saying something about whether or not it is true. For example, Norris (1997) criticises sociologists engaged in SSK for mistaking the context of scientific discovery for the context of justification, and working with the former as if it were the latter. However, the reason that SSK aims to treat both ‘true’ and ‘false’ beliefs symmetrically is precisely to avoid making such epistemological blunders. Because the problem only arises when the scientific practices and the findings that arise from them are not treated as epistemologically privileged, some writers (Fuchs 1991, 1996) have asserted that issues of reflexivity arise when a less legitimate discipline (such as SSK) is seen to be attempting to ‘explain’ a more legitimate one (such as physics). This general assertion is supported by evidence from those who have attempted to ‘study up’, for example Sheehan (1993) notes that “while the self-examination inherent in critical anthropology is a valuable corrective to the presumption of western omniscience, it has also constrained analysis of the hierarchies of knowledge and power that obtain within intellectual communities that now challenge western anthropology’s authority” (1993 p253). However, this is not a criticism of SSK (or other ‘weak’ fields) but of efforts by stronger academics and fields to protect their status by denying the reflexive potential in their own practices.

Collins’ response (that sociology cannot be its own critic) is only one of a number of strategies to manage this problem in practice. Ashmore (1989) and Woolgar (1988a) adopt a slightly different type of strategy, which accepts that reflexivity undermines universal truth claims and seeks to produce studies and texts that enact both topic and resource simultaneously. In doing so, they were instrumental (with Mulkay 1985) in an apparently short-lived experiment in the use of ‘new literary forms’, or alternatives to the

usual univocal, linear structure of academic papers (such as this one). Alternative forms used included plays, dialogues, encyclopaedias and, it was claimed, discourse analysis (see Chapter Two). This approach has been widely and largely unfairly criticised from a number of directions. For example, Fuchs (1996) notes that “no observation can observe how it observes at the same time that it observes what it observes” (1996 p321). This statement, critical of new literary forms, stems from Fuchs’ distinction between philosophical and sociological metatheory (Fuchs 1991), the former being an inevitable but undesirable by-product from weak academic fields. However, as I have argued above, such reflexive metatheory is not intrinsic only to SSK. Another, and persistent critic of new literary forms is Pinch. He notes that “in order for any claims to be made some areas of discourse must be privileged... Bloor in effect privileges his own discourse, Collins privileges social science discourse, and Mulkay, Woolgar and Ashmore claim to privilege nothing at all, and thereby, as far as I can see, claim nothing at all.” (Pinch and Pinch 1988 p188). This is, so far as it goes, true; however, it does not go far enough. In replying to an article by Collins and Yearley (1992a) that criticises radically reflexive work along similar lines as does Pinch, Woolgar (1992) notes that the Bath School of SSK, with whom Pinch may be aligned for the purposes of this discussion, is enmeshed in what he calls an ‘ideology of representation’ (Woolgar 1988b). This phrase calls attention to a distinction between (at least) two views of language; language as representing the world and language as interaction. The former can be associated with conservative and pragmatic (constructionist) forms of hermeneutic approach (Butler 1998), which are also associated with naïve and social realist stances respectively, whereas the latter can be associated with critical and radical (deconstructionist) hermeneutics, which are also associated with epistemological and political relativism. I shall return to this theme in Chapter Ten. The significance of Woolgar’s comment on Collins and Yearley (1992a) is that it identifies Bath School SSK and radically reflexive work as having very different projects. That is, from Pinch’s perspective, it is impossible to make knowledge claims from a position of radical reflexivity, whereas Ashmore (1996) does not seek to make knowledge claims as such but to offer analyses of how they come about and what they do. Of course, even these

analyses are, from a social realist perspective, self-undermining, and they have been criticised for sacrificing practical significance on the altar of methodological purity.

Several writers have criticised works such as those by Ashmore (1989) and Mulkey (1985) on the grounds that, by rejecting a social realist stance, they resist being engaged with practical issues such as those relating to public or science policy. Among such writers are Hamlin (1992) and Evans, Guy and Martin (1999). In a rather confused article comparing SSK with technology studies, Hamlin (1992) first notes that politically committed writers and researchers have looked to SSK to invert the epistemic hierarchy of the sciences and so challenge vested interests. In this light, the perpetual scepticism of Ashmore and Woolgar prompts Hamlin to be concerned with the implications of relativism. That is, political intervention cannot be grounded on an epistemologically sceptical position. However, Hamlin then suggests that some practitioners of SSK, specifically including Ashmore, consider their work to stand in a superior epistemic position to that of scientists. On the basis of these somewhat contradictory assertions, Hamlin advocates that practitioners of SSK should stop being concerned with “methodological purity” (1992 p534), cross the boundaries of academe and begin work in the “land where the doers do” rather than the “land where the explainers explain”. However, that such a vigorous defence of the social realist perspective should understand reflexive practice as simultaneously claiming both epistemic superiority and relativism somewhat undermines Hamlin’s call for SSK to leave the ivory tower. Evans, Guy and Martin (1999) offer an analysis of the development of urban energy policies couched in terms of an opposition between technocratic planners and those seeking a more participatory approach. The argument is put forward that practitioners of SSK should abandon epistemic and political neutrality in order to deconstruct the powerful technocratic complex and show how it is socially constructed. This is because of alleged similarities between the participatory approach to policy and SSK itself; they are ‘on the same side’. Although not responding specifically to either of these critiques, Ashmore (1996) offers a cogent rejection of calls for SSK to abandon epistemic relativism and the reflexivity that goes with it. To do so involves selecting *a priori* which parties are most in need of SSK analysis, a question that is inherently as well as practically problematic.

That is, for example, committed practitioners of SSK engaged in disaggregating the complex of interests and practices that made up an apparently powerful party to a controversy might find themselves inadvertently helping that party by making it difficult for it to be held responsible for its actions³. By rendering reflexive, self-undermining analyses, SSK avoids capture by any side in a scientific or policy dispute. However, this also means that SSK will only be supported within liberal higher education, since no other organisation would allow such a potential Trojan horse to operate.

A question arises, and is not addressed at this point, as to how reflexive this study or text is. For the moment, although perhaps only as a strategic move, this study remains within the style of social realism.

SSK - topic

Figure 1 suggests that SSK is linked to other theoretical, methodological and topical concerns in this study. As noted above, it can be argued to be configured as a critique of the sociology of science. Its links to Actor-Network Theory (ANT) and the Social Construction of Technology (SCOT) are less oppositional. The relation of SSK to SCOT is usually described in terms that have SCOT as in some ways derivative of SSK (Woolgar 1991a), whereas the relation of SSK to ANT is perhaps best characterised as that of siblings with at least one common ancestor (Latour and Woolgar 1979). The relevant features of these relations for this study are described in the pertinent sections below. In terms of methodology, discourse analysis (Gilbert and Mulkey 1984) is important as a nexus of science studies, ethnomethodology and post-structuralism. As a principal methodology in this study, discourse analysis is discussed at length in Chapter Two. This leaves the relation of SSK to the topical concerns of scholarly communication and the information chain.

3. Ashmore uses the hypothetical example of a dying smoker suing a tobacco company. In making problematic the state of the company's knowledge, an SSK practitioner would make it difficult for the litigant to claim that the company knowingly sold a harmful product.

The boundary that was intrinsic to classical sociology of science between the scholarly and the non-scholarly in terms of information and communication practices is deconstructed by SSK's insistence that the content of scientific knowledge must be a part of any study of science. Indeed, perhaps the most lasting achievement of social realist SSK might be the reconceptualisation of science from knowledge to practice and culture (Pickering 1992). From this perspective, then, academic articles, books and theses are arenas in which the institutionalised interests of academics can play out the various interpretative flexibility and closure mechanisms of scientific practice, as in the case of the US and Italian physicists reported by Collins (1998). The most interesting feature, then, of any purported boundary between scholarly communication and the information chain is how such a boundary is maintained and managed.

The use of citation patterns offers an example enabling a direct comparison between the approaches of classical sociology of science and social realist ('Bath School') SSK. Whereas the former held citation patterns to relate to purely scholarly matters, these do not exist as explanatory resources in the latter. Instead, the persistence of citation studies in the face of continuing criticism is explored by Woolgar (1991b) in terms of their institutional character rather than their value in assessing, for example, academic quality. That is, citations are in some sense constitutive of what they purport independently to measure, and citation studies are helpfully understood as elements of a socio-technical institution that includes citation databases, libraries, departments of information science, research assessment procedures and even the very idea of academic quality. Furthermore, in a reflexive turn, it is the institutional, rather than the academic, features of citation studies that ensure their continuation in the face of academic criticism. In another study, this time in dialogic literary form and drawing on both Foucault and Latour (see below), Hicks and Potter (1991) also conclude that citation analysis constitutes, rather than indicates, academic quality. In their terms, it is a powerful disciplining technology. In summary, the social realist SSK view of scholarly communication and the information chain is that the boundary between them is a

contingent resource available to those (academics, database owners, librarians and so on) pursuing their disparate interests within this field.

Social Construction of Technology

A common account of the relation between SSK and the Social Construction of Technology (SCOT) is that a constructionist (that is, broadly, a relativist) approach moved into technology studies after it had become common in science studies. It is, perhaps, not immediately clear why the relativist stance expanded from the study of science to the study of technology. Certainly, the two are commonly conflated or linked as 'science and technology studies', and it is commonly asserted that technology is the application of science. However, such *a priori* associations sit uneasily with a relativist stance, and empirical studies have shown a complex relationship between science and technology (for example Callon, Courtial and Laville 1991). The move from SSK to SCOT was certainly contested (Pinch and Bijker 1984, Woolgar 1991, Pinch 1993a, Woolgar 1993). Indeed, Woolgar (1991) has argued that such a move risks deflecting effort and attention from the reflexive consequences of SSK. One of the axiomatic principles of social constructionism is that facts and artefacts require sociological explanations for their acceptance, rather than epistemological explanations, so that the clarity of the Empirical Programme of Relativism (Collins 1981) might be called on as an explanation for the 'turn to technology' (that would require confirmation from those involved), but the success of 'applying' social constructionism to technology could not be called on as an explanation since that success is the very thing that needs explaining. However, that the social construction of technology has emerged as an overarching term for a number of more-or-less relativist approaches to studying 'technology' is hard to dispute. Just as SSK was configured partly as a critique of an earlier approach, so SCOT did not become established in a theoretical vacuum, so that a brief review of how this occurred is called for.

Background to SCOT

Theories of technology are legion and as varied as the definitions of the subject matter. A useful introduction to UK research into social studies of technology is provided by Williams and Edge (1992, 1996) who argue that, in reaction to what has been characterised as ‘technological determinism’, four distinct research traditions can be discerned: economic analyses of technological change; critical studies of technology policy; the sociology of industrial organisations; and the social construction of technology. The fact that Williams and Edge take technological determinism as their ‘other’ against which to compare a series of otherwise disparate and ill-defined traditions is significant. In much of the literature concerned with technology, ‘determinism’ of many hues has been an issue (see Note 2). Questions of determinism, agency and structure permeate this work, and are reflected in the four traditions identified by Williams and Edge. Three of them imply, either explicitly or implicitly, a strong role for economic factors in determining technology.

The work characterised by Williams and Edge as economic analyses of technological change does not necessarily take economic factors as solely determinant of technology, but has looked at technological development in the long term and sought to relate it to long term economic phenomena such as Kondratiev cycles (Freeman 1984). Kuhn’s (1970) notion of paradigms is often invoked as an analogy, although other writers have included an evolutionary perspective and a focus on technology ‘trajectories’. This work has often taken a broad view of technology. Although rarely understanding technological innovation as merely the result of market demand (as in the simplistic neo-classical account), economic analyses have tended to see technology as stable, and to take a somewhat teleological (‘Whiggish’) view of change. That is to say, the successful achievement of the present state of affairs is invoked as an explanatory resource for decisions made in the past. Critical studies of technology policy have also tended to take a broad view of technology in examining the various structures, factors and interests that make up the context for national and supranational policy decisions. Neither of these traditions (economic analyses or policy studies) has had a clear focus on the content of

technology and the everyday practices that contribute to its change and implementation, so that their contribution to the current study is marginal.

The sociology of industrial organisations was first stimulated by the work of Braverman (1974, 1985) and his labour process theory. In this approach, technology is seen as a means by which capital gains control over workplace processes by powerfully renegotiating the structure and content of workplace tasks themselves. Capitalist economic relations underlie understandings and deployment of specific technologies. Some of the most notable empirical work in this tradition has been undertaken by Noble (1985) on the emergence of numerically controlled machine tools and their role in removing decision-making processes from the shopfloor, as well as enhancing the efficiency of the processes to which they were applied.

SCOT emerged owing a considerable debt to the work of Braverman and Noble, but also came out of the radically different tradition of SSK. Taking a cue from Collins' Empirical Programme of Relativism, discussed above, SCOT research highlights interpretative flexibility in the early stages of the development of a technology, where different significances and purposes of artefacts can be settled on by different groups of people. Whereas economic analyses of technology see the artefact as stable, and neo-Marxist approaches see the interests of actors as stable, SCOT approaches emphasise the instability and constructed nature of artefacts and interests.

SCOT as practice

SCOT approaches are exemplified perhaps by the detailed work of Bijker (1995), the ambitious surveys of Hughes (1983), and the reflexive studies of Grint and Woolgar (1997). Although not all studies follow closely the three-stage Empirical Programme, they are all concerned to show how the interests of a variety of groups struggle to link together into stable networks of the social and the technical. Thus, whereas SSK is concerned with the social construction of facts, SCOT is concerned with the social

construction of artefacts; the symmetry is compelling but, as noted above, contested. (The pervasiveness of the network metaphor also links SCOT to Actor-Network Theory; see below.) An example of SCOT serves both to illustrate the approach and as a focus for critique.

Pinch and Bijker (1987) offer an analysis of the development of the bicycle, in which a linear, progressive view is discarded in favour of a multidimensional view in which the interests of a variety of relevant social groups, with a (detailed) variety of attributes such as economic power, come into play over a period of time and result in the 'invention' of the safety bicycle. Aspects such as pneumatic tyres are then seen, not as the inevitable march of scientific progress, but as the solution to a specific and specifiable set of problems for an equally specific and specifiable social group, and such analysis can be backed up using documentary evidence.

Woolgar's (1991a) critique of this approach is analogous to that pertaining to SSK, that its social realism privileges the analyst's interpretation of precisely which technology or artefact is being considered, and that interpretation excludes the analysis itself as a potential artefact. Woolgar therefore calls for a more 'thoroughgoing interpretivism'. Variants of this debate exist between reflexive and sociological approaches (Kling 1991a, Woolgar and Grint 1991, Kling 1991b, Kling 1992a, Grint and Woolgar 1992, Kling 1992) and between reflexive and feminist approaches (Grint and Woolgar 1995, Gill 1995, Woolgar and Grint 1995) to technology. As with the debate within SSK discussed above between positions represented by Ashmore and Hamlin, the sociological, feminist and other social realist writers commonly accompany their arguments with calls for the analyst to leave the ivory tower and become engaged in political struggle. Even philosophers have taken this line (Durbin 1998). The debates continue between those who might be considered 'auto-reflexive' (such as Woolgar) and those whose faith in sociology as a discipline allows them to assume that constructionist research into socio-techno-science will be reflexive as a whole, even if particular studies are less concerned with methodological issues. To an extent, these debates relate to the kinds of questions available to researchers, rather than to the legitimacy of research undertaken within either

camp. For example, both Pinch (1993b) and Woolgar (1991c) have conducted research into usability trials. Both analysts agree that social relations can be 'frozen into' an artefact or system, making certain uses of it easier for future users than others. However, for Pinch, the key questions concern the relation between trials and actual, 'for real' use of a system, whereas for Woolgar the key questions concern how the trials configured a particular kind of user and how this idea of a user was then available to accomplish things within the company producing the technology. Whereas Pinch is able to discuss matters concerning similarity and difference, Woolgar is able to use his own text to exemplify matters concerning description, metaphor and the granting of intentionality.

Whereas Woolgar can be argued to be criticising SCOT research as being too political (that is, privileging certain perspectives such as feminism), Winner might be argued to be criticising SCOT for not being political enough. An influential and experienced researcher (1980), Winner (1993) offers a critique of SCOT that casts the approach as assuming a pluralist version of politics that is susceptible to the charge of a certain naivety. That is, just as a pluralist theory of politics has pressure groups, professional bodies and so on that are assumed to represent all important interests in society, so SCOT researchers seek to identify, usually from documentary sources, all the relevant social groups around the development of a particular artefact. A problem arises, however, when we ask whether power can be exerted to prevent certain interests even being formulated and recorded at this level (Lukes 1974). On the other hand, it is not hard to think of long term structural influences, perhaps economic, perhaps even technological, that would not need to be formulated as specific documentary evidence in order to influence the development of an artefact. Ironically, given Winner's equal hostility toward both interest-based SCOT and auto-reflexive research practice, the persistent scepticism of the latter might be one way of addressing the undoubted limitations of the SCOT approach. That is, a self-undermining, reflexive analytic account can reveal by analogy how similar self-undermining features are present in otherwise highly legitimate and 'common sense' discourses such as those often found within economics.

SCOT - topic

Figure 1 suggests that SCOT has theoretical links with SSK, as described above, and with ANT, as illustrated below. It is also relevant to the boundary between the topics of technology and the information chain. That is, as noted above, one of the most important contributions of SSK has been to topicalise the boundary management work that defines the commercial and social practices of the information chain and the scholarly practices of academic research. In the same way, one of the most important contributions of SCOT has been to topicalise the boundary management work that defines commercial and social practices such as those of the information chain from what are seen as purely technical matters. That is, “society is not determined by technology, nor is technology determined by society. Both emerge as two sides of the same sociotechnical coin, during the construction process of artefacts, facts and relevant social groups.” (Bijker 1993 p125)

Where citation analysis offered an example of the scholarly communication / information chain boundary relevant to SSK, the digital library offers an analogous example of the boundary between the information chain and technology. Kilker and Gay (1998) offer an analysis of how new library-based services could be facilitated using a design methodology based on concepts derived from SCOT such as relevant social group, interpretative flexibility and closure. The boundary between the information chain, represented in this study by the library, and technology is defined according to a hard / soft metaphor, where hard technologies are either legacy systems⁴ or the result of institutional decisions either prior to or beyond the scope of the study. In contrast, the user interface is described as ‘soft’, that is malleable within the bounds of the study. Although noting that “the notion of a technology’s hardness or softness need not be shared by all relevant social groups” (1998 p66), Kilker and Gay do not suggest that their definition could be challenged within the study by another social group. Here, then, the boundary between the information chain, represented by the interface design and the library, and the core technology is defined in terms of the scope of the evaluation study,

4. The rigidity and solidity of such legacy systems has resulted in them being called ‘electronic concrete’ by some analysts (Quintas 1996, Dutton 1996)

which was presumably set by its funders. Kilker and Gay do note that evaluation is as socially constructed as the technology being evaluated, but in their terms this is only until the technology gets hard or the funders stop paying. As an acknowledged act of depoliticisation, this renders the approach susceptible to Winner's (1993) charges that the relevance and consequences of structural factors cannot be accounted for within SCOT. Perhaps inadvertently, then, this study illustrates how the boundary between the technological and the social is a contingent matter whose management offers a useful topic of analysis.

A more reflexive study is described by Rachel and Woolgar (1995), wherein the analysts were attempting to conduct ethnographic research of a computerised information systems development project. In their efforts to find out where the 'technical' work was undertaken, the analysts were directed to various sites and it became clear that the idea of the 'technical' was being used as a category device to do boundary work. That is, not only have social scientists come to focus their attention on the boundary management between what comes to be seen as technical and what comes to be seen as commercial, or social, so have practitioners, software engineers, marketing departments, secretaries and so on⁵. The technical is a reflection of the costs of accessing a particular kind of space, costs that are borne equally but differently by practitioners and by analysts researching them.

Social construction, then, has informed both SSK and SCOT in their more sociological guises. Reflexive critiques and alternatives exist to both. One approach that stands slightly to one side of both of these developments, although being strongly cognisant of them, is Actor-Network Theory.

5. This kind of deflation of sociological concepts into mere echos of the resources used by participants has been a topic of ethnomethodology, for example Pollner (2000).

Actor-Network Theory

The Actor-Network Theory, or ANT, is most associated with work undertaken at the Ecole des Mines de Paris by Bruno Latour and Michel Callon, and with the work of John Law. It emerged in the 1980s between scientometrics and science and technology studies. The approach itself is highly variable in form, and probably cannot legitimately be called a 'theory'. Indeed, labelling the approach at all is problematic; Latour has noted that "there are four things that do not work with actor-network theory; the word actor, the word network, the word theory and the hyphen!" (Latour 1999). However, it is an approach that has been highly influential in recent social theory, especially that concerned with science, technology and power. In one of the founding works of ANT (Latour and Woolgar 1979), the authors report ethnographic work on the tacit knowledge and local negotiations that go into the production of scientific practices and knowledge. Also noted was the way in which a disparate array of entities involved in these processes could be understood as 'inscription devices', or as entities that are semiotically active, that is, productive of texts. This turn toward text is emphasised in subsequent analyses by Latour (1987, 1992), and links the emerging ANT framework with the post-structuralist turn in the social sciences.

The unit of description in ANT is the *actor-network*, which is an entity, an *actant*, only so long as it is actively maintaining itself as such within the discourse in question. It does this by interacting in particular ways with other actor-networks, which thereby contribute to its existence. Each actor-network is potentially made up from a number of other actor-networks that it has previously *enrolled* or *translated* and currently maintains in particular relationships with each other. It is *potentially* made up in this way because disaggregation is always a possibility, but until it happens the actor-network retains its integrity. An actor-network can, on the other hand, be recruited into another actor-network so that, for the purposes of that second actor-network, the first loses its independent identity for as long as its recruitment is maintained. The clause in the preceding sentence, 'for the purposes of the second actor-network', is important. Actor-

networks are entities within discourse, and realist interpretations of them as worldly entities are inappropriate. For example, within a particular discourse the following entities might exist; John, Mr Smith, the manager, the chair of the meeting. Within ANT there is no *a priori* reason to identify these entities with each other, even though a realist view of the situation under analysis might claim all four as mere versions of the same essential being, John Smith the manager chairing the meeting. This is the sense in which ANT is “a ruthless application of semiotics” (Law 1999).

Work is required to maintain the integrity of an actor-network, as it is always liable to disintegrate into constituents (which will themselves be actor-networks). When an actor-network has been successfully enrolled as a node in a larger actor-network, it is said to have become *punctuated*. Within an actor-network, such a node may become an *obligatory passage point*, or an essential ingredient in the work of further translation. When an entity is able to speak for an array of heterogeneous elements in an actor-network, then it has become a *centre of translation*. An entity that is simultaneously in two or more actor-networks will move through each in a different way, being a link between the actor-networks but itself being marked by the process; this is a *boundary object* or perhaps an *immutable mobile*.

ANT is a reflexive project. There are a number of clusters of research accounts that have enrolled (or been enrolled by) ‘ANT’. They include the methodological works of Callon (1991) and Latour (1991), pioneering scientometric texts (Callon, Courtial, Turner and Bauin 1983, Callon, Courtial and Lavoie 1991), theoretical work on explanation (Latour 1988, 1990, Frickel 1996, Michael 1996), empirical work on sociotechnology (Akrich 1992, Latour 1993, Callon 1987, Callon and Law 1989, Brigham and Corbett 1997, Mort and Michael 1998) and sociological critique (Law 1991, Leigh Star 1991). In each of these, ANT is presented slightly differently, so that consistency in either methodology or accounting practice is not a defining quality of ANT.

Callon’s approach to ANT is best described in (Callon 1991), whereas Latour’s less conventional, more suggestive accounts are best illustrated by (Latour 1988, 1991). In

these texts, accounts are presented that differ fundamentally from those of sociology or science. In particular, they undermine the concept of 'agency', both human agency and that of 'the natural world'. Whereas Callon's theory of ANT is based on collapsing any necessary distinction between humans and commodities in terms of their circulation in a network, Latour's account is based on undermining any necessary distinction between humans and technological (including experimental) artefacts. In each case, the remaining entities are more or less disciplined, enrolled or translated actor-networks. Callon's theory involves actants as authors, putting intermediaries into circulation (enrolling them) in actor-networks that are defined by this activity. These networks can become converged when actants are successfully (irreversibly) mutually defined (translated). Highly converged networks can be treated as black boxes (punctuated), or as nodes in a larger network. Latour uses a number of accounts to describe ANT, one of the more common being that of the program-antiprogram (Latour 1991). In these descriptions, Latour describes semiotic moves and counter-moves employed resulting in the effect of the final account.

Callon's study of the building and uncertain maintenance of a network involving researchers, shellfish, fishermen, and 'the consumer' (Callon and Law 1989) illustrates the lack of *a priori* categories, the emphasis on induction, that is a characteristic of ANT. It shows how the entities in the story, actor-networks, established and maintained themselves as such by translating other actor-networks within the discourse (of which they were, of course, constitutive) into compliant components for a period of time. It also shows how such translations were reversible, and how previously compliant actor-networks re-established distinct identities for themselves. Latour's analogous empirical work (Latour 1993) is similar, showing how projects involving people, machines, money and politics either succeed or fail in appropriately enrolling these entities as stable and supporting nodes within their actor-network. The work of these two central figures has been taken on by many other researchers. Brigham and Corbett (1997) use ANT to support a semiotically-informed examination of the introduction of an email system in an organisation, Mulcahy (1998) develops an ANT account of a competency-based training programme in Australia, and Mort and Michael (1998) assess the potential for physically

absent (redundant) actor-networks to discipline those remaining in a study of a major military-industrial complex.

There have been several critical commentaries on ANT and, as with relativist approaches generally, they can be grouped as political / ethical or epistemological. The political / ethical critique has two strands. Firstly, some (Law 1991, Leigh Star 1991) have asserted that the recommendation by some ANT theorists (Callon 1987) to 'follow the actors' (across conventional divides, such as those of academe) can be used to exclude those who do not obviously feature as 'actors' in a particular circumstance. There could be a tendency toward the 'great man' theory of history (Hughes 1986), or toward a 'managerialist' implementation of ANT (Leigh Star 1991). Law has, perhaps, been most active in addressing ANT to this critique (1991, 1999), and he notes that it is important for researchers to be aware of this potential. The second political / ethical critique relates, perhaps, most particularly to the work of Law, and concerns the nature of difference, and the ethical implications of collapsing all *a priori* differences, including that between human and non-human. Not only is this a difficult stance for conventional sociology, but it is also potentially highly offensive (Law 1991). The difficulty for sociology of either maintaining or collapsing the human / non-human distinction is unsurprising, since it raises the questions of agency (Berg 1998, Michael 1996, Grint and Woolgar 1997) and of attributed versus inherent qualities of entities; that is, whether descriptions of things relate to qualities attributed to them by those doing the describing, or whether they relate to the 'things-in-themselves'. This is clearly a metaphysical question (perhaps *the* metaphysical question), and brings us back to the debates already discussed around relativism, realism and explanation (Collins and Yearley 1992a, 1992b, Callon and Latour 1992).

The ontological levelling of semiotic ANT renders the 'interests' accounts of social realist SSK problematic because, from an ANT perspective, interests, like facts, only become solid enough to analyse after sufficient work has been put in to render them a stable network. Furthermore, the collapsing of all *a priori* ontological distinctions undermines the whole notion of interests as attributes only applicable to humans. From

this perspective, ANT has more in common with radically reflexive SSK than with social realist SSK. However, Latour (1988) argues that the new literary forms of Ashmore, Woolgar and so on are based on an idea that it is possible to write a truer text by using particular self-referential textual tricks. Instead of this 'meta reflexivity', Latour advocates the 'infra reflexivity' of self-exemplifying realist analysis and accounts. That this is a problematic approach is seen when he uses it to appeal to academic writers: "To the few wooden tongues developed in academic journals, we should add the many genres and styles of narration invented by novelists, journalists, artists, cartoonists, scientists and philosophers." (Latour 1988 p173). It is hard to imagine Ashmore disagreeing.

ANT - topic

Figure 1 suggests that ANT is linked to SSK, this link being both established and maintained principally by the work of Latour (Latour and Woolgar 1979, Latour 1987). Its links with the SCOT have been intimated in the above examples of its use by sociologists including, again, Latour (1993). In terms of methodology, this study is particularly concerned with co-word analysis, which is described in Chapter Three. This leaves the relations of ANT as topic to scholarly communication, the information chain and technology.

Latour (1987) has developed an understanding of scientific literature based on ANT. Here, propositions are phrased as arguments that work in a similar way to the program-antiprogram schema described by Latour (1991). That is, the origins and consequences of a proposition are brought into play as arguments in deciding on its status as a fact, and this can be done both prospectively and retrospectively in a text. The proposition is an actor-network that can either be believed and built on or disbelieved and deconstructed, and the scientific literature is one arena in which such processes are played out. Scholarly communication is necessarily, therefore and among other things, an exercise in rhetoric. Rhetorical devices are used, either as positive modalities, to black box a statement as a fact, attend to its consequences and build from it (thereby building it into a

larger actor-network), or as negative modalities, to deconstruct a statement, undermine its facticity, attend to how and why it was produced and so render the actor-network fragmented. Scholarly communication is therefore an attempt to produce texts that are resistant to challenge, and the more challenges a text is configured to withstand, the more complex and technical it is likely to be. "The transformation of linear prose into, so to speak, a folded array of linear defence lines is the surest sign that a text has become scientific." (Latour 1987 p48) As an example that relates to the discussions above of SSK and the Sociology of Science, we might again consider the practice of citation. Latour argues that citation should be understood as a strategy of persuasion, so that related texts can be aligned with the current one, critical texts can be aligned against each other or otherwise disabled. In this way the scholarly literature is configured as a positive modality, stressing both the difficulty in deconstructing the current paper and the progressive project in which it is engaged. The corollary of this is that papers acquire status retrospectively, by being cited or not, demonstrating that fact construction is a retrospective, collective activity. Luukkonen (1997) notes that this theory of citations has not been widely accepted in the bibliographic research community because it does not support, as a Mertonian approach does, current research programmes that use citation analysis, and because it is built from a relativist rather than a social realist base. These reasons mirror those given by Woolgar (1991b) for the persistence of research based on citation analysis in the face of the SSK critique, suggesting that there are similarities between the two approaches. There are, as I have noted however, also differences.

Formal scholarly communication represents then, according to Latour, an actor-network that is an arena in which artefacts and practices emerge as attempts to enrol stable and legitimate resources, such as the authority of citations. Formal scholarly communication artefacts and practices might include articles, journals, writing and publishers. The academic information chain can be considered to be another actor-network in which different, but overlapping, artefacts and practices emerge. Alternatively, and perhaps more in keeping with Latour's emphasis on the heterogeneous character of actor-networks, the two might be considered to be classes of element within a single (potential) actor-network, the classification being the result of the action of other forces, such as

economic theory or the institutions of higher education and publishing (themselves, of course, comprehensible in terms of ANT). The distinctions between the scholarly and the commercial may therefore be exogenous to the relations between them, that is, they may be distinguished not by reference to their own constituents but by reference to other actor-networks. Furthermore, in the same way that an academic paper only becomes a stable, legitimate resource by the actions of future readers and writers (Latour 1987), so the attributes of the scholarly and the commercial only come to be distinguishable as such by the actions of future actors. Just as in the discussion regarding SSK, then, the establishment and maintenance of the boundary between formal scholarly communication and the academic information chain is predicted by ANT to be a useful site for research, although the interpretation of any findings may be quite different. The boundary between the academic information chain and machinic technology is, in the same way, likely to be a fruitful site for research.

Topics

What are the topics of this study? At one level, the answer to this question is given in Figure 1. That is, the topics are formal scholarly communication, the commercial, academic information chain, and machinic technology, and the relations between them. The question is then how to construe and operationalise these as topics within the theoretical approaches described above and the methodological approaches described in Chapters Two and Three. This way of understanding the current study is addressed in this section. However, there is another way in which the idea of 'topic' is available to this study, and that is in considering the principal theoretical stances described above, classical sociology, social constructionism, radical reflexivity and actor-network theory, as the topics. In this understanding of the study, scholarly communication, the information chain and technology are the field against which theories are, in a naïve realist model, tested. The fruitfulness and reflexivity of this reorientation of the study is investigated further in Chapter Ten, following the ostensibly empirical section of this study.

From the classical sociological perspective, the worlds of the scholarly, the commercial and the technological require explanation in different terms. Scholarly work depends on scientific norms and reward structures, commercial activity is governed by economic forces, and technology represents material agency. Hence, descriptions of each of these topics would not necessarily have any relation to each other, and the boundaries between them would not be analytically interesting. The role of the analyst would rather be in explicating the social norms, structures and so on that affected the behaviour of people working on scholarly, commercial or technological projects. From the perspective of social construction, the three topics are the result of the exercise of interests. That is, the constituents of scholarly work (the practices of reading and writing, the artefacts of journals and articles, and so on) are the result of the exercise of social interests. These interests and others may affect the arrangements and composition of the academic information chain and, indeed, of relevant technological systems. The roles of the analyst

would be in explicating how people's purposeful or inadvertent (non)actions contributed to the content of scholarly, commercial or technological artefacts, and how these distinctions, once practically established, were a contingent resource for such people. From the perspective of radical reflexivity, research analyses offer opportunities to create critical commentaries on how such topics as formal scholarly communication can become topics, and what that says about those analyses in particular and analysis more generally. From the perspective of actor-network theory, the artefacts and practices relating to the topics are the result of efforts to stabilise heterogeneous networks, and that these efforts can be traced by analysts through evidence of translation, where a network becomes an element in another network. Conventional boundaries, such as those between scholarly, commercial and technological practice, offer a useful site for evidence of such translation.

What follows are conventional definitions of the three topics from Figure 1. They are conventional in the sense that such definitions can themselves be topicalised, as described above. However, they are definitions based on two distinct sources of domain expertise. Firstly, the author has practical experience of all three topics, having published scholarly papers, worked in a library, and conducted research (of which this study is only one account, see Jacobs et al 2000) into the information chain and electronic systems. Secondly, the fieldwork (that is, interviews) described later in this study involved contributions from a large number of practitioners in all three fields; scholars, librarians, publishers, marketing managers, system developers and so on. The following brief definitions were derived from these two sources of expertise. Although contestable in many ways, and indeed perhaps for that very reason, these definitions act as resources for both the discourse and the co-word analyses that follow. That is, they are initial glosses that serve as a starting point for analysis understood as iterative re-description.

Formal scholarly communication

A description of formal scholarly communication would start with the idea of a literature made up of texts in the form of journal and periodical articles, books, newspapers, and other types of document. These texts might include pages, diagrams, tables and abstracts. Currently, they would probably be held in a local collection. They would be scanned or read in the course of writing new texts, and would therefore be subject to the practices of citation and referencing.

Academic information chain

The chain of actors involved in the academic information chain would include publishers, document delivery suppliers (including the British Library Document Supply Centre, BLDSC), databases, librarians, libraries, and academics as researchers, users and even customers. Commercial relations and entities would include companies, consortia, contracts, and subscriptions. The legal framework would be provided by copyright.

Machinic technology

The machines used by those engaged in formal scholarly communication or the academic information chain would include computers (perhaps mainly PCs or Macs), printers, photocopiers, monitor screens, and other technical systems. Accessories and attributes of these machines would include CDROM drives, discs, memory, networks and software such as Adobe Acrobat⁶. Online facilities would include email and downloading from the Internet / Web.

6. The Acrobat reader software from Adobe Systems Inc. was, at the time of the fieldwork, a common package that allowed for the transfer of documents across hardware and software platforms.

These definitions are the first stage in operationalising the three topics from Figure 1; rendering them susceptible to analysis. They are by no means intended as final. Analysis inevitably operates as an iterative process on whatever topics are initially identified. The analyses in this study being of interview data from academic researchers, librarians, publishers and so on, the above definitions were merely sensitising the analyst to the possibility that, for example, when an interviewee used the word 'network', the category of technology might be in play. Of course, the two methodologies noted in Figure 1 used the definitions in different ways, discussed at the appropriate points below.

Chapter Two: Discourse analysis

Introduction

The purpose of this section is to embed the methodological principles and practices employed during the social constructionist discourse-analytic parts of this thesis in the academic writings and controversies relevant to them. As a simplifying heuristic, these writings and controversies can be presented in terms of two major lines of academic work, which have at the present time given us post-structuralism on the one hand and ethnomethodology on the other. Should this characterisation be allowed to stand, some of the differences between the two traditions can be argued to be long standing indeed. For example, the two traditions can be mapped with some degree of accuracy onto either side of the distinction made by Kant between the regulatory and the constitutive effects of a rule. That is to say, the tradition that has today given us post-structuralism tends to emphasise the regulatory effect of a rule; a top-down perspective, discipline, the deployment of social power and so on. The tradition that has today given us ethnomethodology tends to emphasise the constitutive effect of a rule; a bottom-up perspective, practical or mundane reasoning as making up social order (Bloor 1992, Lynch 1992a, 1992b).

Clearly, arguing for a retrospective characterisation of academic work is teleological, but evidence can be found and will be presented to support a contention that the orientation of relevant authors in each of the traditions was to a canon that is recognisable in the characterisations presented here. Of course, as Foucault notes, this is not sufficient: “The mapping of antecedents is not enough, in itself, to determine a discursive order” (1972 p143). However, it is suggestive.

This section, then, will outline briefly the canons of the two lines of theoretical academic work within which the discourse analytic methodology of this thesis is embedded. It will then describe three approaches to analysis that are informed by the two literatures, one of which draws them into contact with SSK and social constructionist work, as described in

Chapter One. Finally, the focus will shift to how three possible features of language use can be understood in terms of the theoretical and methodological literatures covered.

These three features are:

- (i) interpretative repertoires or discourses;
- (ii) subjectivity and deixis (self-referral); and
- (iii) social interests.

It will be argued that these three possible features of language use are consistent with both the academic traditions outlined. However, this argument will, of necessity at this point, remain in terms of theory or “secondary analysis” (Schegloff 1999a). These features form the basis for the two pieces of discourse analysis presented in this thesis (Chapters Six and Eight), concerned substantively with technology, scholarly communication and the information chain (as defined in Chapter One).

Theoretical background

From Saussure to Foucault and post-structuralism

During the last 100 years, and especially since the Second World War, language has increasingly become a major focus of academic inquiry. Much of the credit (or blame) for this focus can be ascribed to Ferdinand de Saussure, whose *Course in General Linguistics* (1974) in the early part of the twentieth century is now acknowledged as a foundational text in structuralist thought. Saussure noted the arbitrary nature of signs, that is, that within the language system, *langue*, (as compared with the linguistic community and with language use, *parole*) relations between signifiers are arbitrary. Within the language system, the key property of a signifier is that it is different from other signifiers, so that a language system is a play of differences and meaning emerges only from this play. Change occurs at the system level; that is, language is to be viewed synchronically rather than diachronically. Language change is thus outside the wills of individuals or, indeed, of a community or society. This has been a highly influential perspective, as we shall see, in that it implies that structure (in this case language) constructs the person as much as person constructs language. Saussure anticipated the

development of a science of signs; semiology or semiotics. Levi-Strauss and, more relevantly for this study, Roland Barthes (1972) took up the challenge after the second world war and, although much of his writing was strongly influenced by the existentialist movement of the time, his development of the concept of myth and his use of this concept as a critical tool in undertaking analyses of prevalent narratives mark out his work as central to the canon of structuralist discourse studies. That Barthes took a cue from Saussure is shown by the following: “For mythology, since it is the study of a type of speech, is but one fragment of this vast science of signs which Saussure postulated” (1972 p111).

The next generation of thinkers for whom the structuralist tradition was relevant was a product of the reputedly radical events of the late 1960s and 1970s. Principal among them was Michel Foucault, although Louis Althusser ensured a continuing strong Marxist influence. Althusser (1971), in attempting to reconcile Marxist political thought with the continuing reproduction of capitalist economic relations, developed a theory of ideology in which individuals were hailed, or ‘interpellated’, into subjective positions within material culture by such practices as secular rituals (shaking hands, for example). The role of language was, correspondingly, to maintain and reproduce the current economic structure by calling individuals into subject positions. Thus, the Saussurian notion that individuals are constructed by language as much as vice versa finds a particular resonance in Althusser’s writings. Similarly in the early writings of Foucault (1973), we can see how the construction of the individual subject is a matter of structural analysis. However, in Foucault’s writings, there is not one ideology wherein subjectivity is constructed, but a number of discourses. Some of these Foucault studied in depth, such as psychiatry and the clinic (1975) and penal practice and prisons (1977). This emphasis on the multiple arenas in which subjectivities could be discursively produced marked a shift from the somewhat monolithic perspectives of previous structuralist thought (whether Marxist or not), so that Foucault’s work has been described as post-structuralist. This is especially true since, in his later writings, ‘technique’ replaced ‘discourse’ as a central feature. Foucault’s early orientation to the work of Saussure and Barthes is evident, for example, in the following: “One can speak, in terms of elements and rules of

construction, of language (*langue*) in general – at least of that language of other times and places which is that of myths” (1972 p201).

The major theoretical aspects to Foucault’s work that are relevant to this thesis are:

- discourses, or regimes of practices – structurally analysable configurations of linguistic and material practices wherein there are sufficient resources to establish truth, deviancy, subjectivity and so on;
- subjectivity – those roles available within discourses, together with their entailments, privileges, and so on, wherein individuals are (self)-disciplined;
- techniques – subtle and transferable regularities of practice resulting from the subjection of (especially) the body to power.

Each of these aspects has been used to understand specifically linguistic practices. For example, the idea of discourse-subjectivity has been deployed by Wetherell and Potter (1992) in mapping the language of racism, and a Foucauldian concept of technology has been invoked by Fairclough (1996) in describing developments in campus discourse.

The structuralist tradition was taken on by thinkers other than those on the French left. For example, in terms of language, Chomsky has asserted a distinction between linguistic competence (knowledge of the structure) and performance (individual instances of language use). This distinction is traceable to Saussure’s founding of modern linguistics on *langue* (system) rather than *parole* (use). Chomsky (1972) based an extensive search for a universal generative grammar on this distinction, which placed him somewhat outside the mainstream until the widespread take-up of cognitive science as the dominant paradigm within psychology. I shall not even address the huge literature on cognitive linguistics (for an introduction, see for example de Beaugrande 1985) except to note that its postulates (the brain as an information processor, interaction as scripts, and so on) are a major ‘other’ against which both discursive psychology (Potter 1996) and conversation analysis (Edwards 1997) have configured themselves (see below). The principal arguments against cognitivism are, firstly, that there is a certain circularity in using mental representations as explanatory resources for behaviour, when that behaviour is itself the basis for inferring the mental representations (Costall and Still 1991). The

second argument against cognitivism is that put forward by Suchman (1987), that computational models confuse two senses of behaviour as being rule-based. However, this anticipates the second of the two lines of academic work, that which started with Wittgenstein.

From Wittgenstein and Austin to Garfinkel, Sacks and ethnomethodology

Wittgenstein's later work (1958) is difficult and remains a source of some speculation. It also remains massively influential. Clearly, I have not space to review either it or its contribution. However, there are key ideas that have served as the basis for much subsequent work. The idea of language games remains one of the most contentious in academic circles. A language game is the set of legitimate linguistic moves within a specified purposeful form of life, which itself is characterised by quiet agreement. Disputes are possible with almost any part of the preceding definition but those that have, perhaps, had the most bearing on social science have been disputes around the ideas of legitimacy and quiet agreement. Wittgenstein's work is, among other things, concerned with the conditions for the possibility of sense. He postulated that purposeful forms of life, or activity, exist by quiet agreement, and that it was only with reference to these forms of life that language was possible. Furthermore, in a move away from a representational model of language, he understood language use as a kind of public activity, that is, an aspect of a form of life. From this we get the idea that the meaning of a word is how it is used, rather than being in some way related to a private intention on the part of the utterer.

Wittgenstein's ideas could be seen to be corrosive to the kind of functionalist sociology being undertaken after the second world war by, for example, Talcott Parsons, wherein sociological categories were used to explain human behaviour including language use. In terms of conduct in general, Garfinkel's early work was directed toward showing the problems of circularity involved in invoking mechanisms such as socialisation and internalisation of norms to support functionalist sociology. He took Wittgenstein's

assertion that quiet agreement was a pre-condition for social action to mean that such mechanisms were theoretically unsustainable. Later (1967), Garfinkel reported a series of 'breaching experiments' that have been argued to demonstrate some of the unacknowledged and participatory ways in which forms of life are maintained in the everyday world. In shifting the focus from the analysts' concerns to those of participants, Garfinkel noted that "following Wittgenstein, person's actual usages are rational usages in *some* 'language game'. What is *their* game?" (1967 p70 emphasis in original). In making this shift, he was developing a form of analysis known as ethnomethodology, which is concerned exactly with the methods people use to maintain order in everyday life.

Another set of work that was to influence the development of an ethnomethodological approach specifically oriented to language use was initiated by Austin in his book *How to do things with words* (1962). This work could also be traced back to issues discussed by Wittgenstein, this time concerning the problems logicians were having in ascribing truth values to certain sorts of sentences such as 'I promise...' or 'I bet...'. Austin's insight was to note that these types of sentence could not be either true or false because they were not representational uses of language. Instead they were what Austin called 'performatives'. From this insight has developed an extensive body of work known as 'speech act theory', some aspects of which have allied themselves with cognitive approaches to psychology. However, Austin and speech act theorists such as Searle (1992) diverge from Wittgenstein in terms both of their individualist perspective and, relatedly, their contractual rather than constitutive notion of rules. It is the recognition that language can be used to do things, as well as say things, that remains the chief insight of speech act theory and the one that was relevant to the development of an ethnomethodological approach to language use.

It is thus that we come to the work of Harvey Sacks (1992a, 1992b). Working with Garfinkel on the ethnomethodological project, Sacks instigated the form of research that has come to be known as conversation analysis. Although regarding Wittgenstein as only "tangential" (1992a p26) to his work, Sacks does build on his move toward an

understanding of language as activity rather than representation. That is, we cannot infer the sense of an utterance by checking its referents; we need to see what the utterance is doing. In this, Sacks clearly also drew from Austin (1962), which he describes as “a wonderful book” (1992a p613). Sacks drew these influences together in a series of lectures, now published, that have become key texts in the ethnomethodological treatment of language use. In them, Sacks unpicks the pragmatic and action-oriented ways in which people use language in the mundane interactions that make up the everyday world, in conversation. (The emphasis on the everyday is important, and I shall return to it below.) So, for example, we see that an immense amount of work is done when someone begins a sentence with “I still say though ...”. By making ‘I say’ explicit, they are making a point of committing themselves to the assertion to follow. ‘Though’ configures the assertion in opposition to a previous challenge, and ‘still’ characterises the assertion as a reprise of a previous assertion. This merely grazes the surface of the kind of analysis offered by Sacks, and which has become highly influential and informs this thesis.

Methodological approaches

Clearly, the analysis of language use is a huge area. It spans, for example, sociolinguistic studies of dialect and social class, ethnographic studies of communication and cognitive studies of interaction. However, bearing in mind the two theoretical traditions outlined above, three relevant methodological approaches can be discerned in the recent literature.

1. Critical discourse analysis (CDA) retains strong influences from structuralist and post-structuralist theories, both Marxist and non-Marxist. Its objective is to show how language use relates to major material and linguistic patterns such as capitalist economic relations or orders of discourse in the Foucauldian sense.
2. Conversation analysis (CA), as we have seen, is described very much as a bottom-up approach whose objective is a formal analysis of the ways in which people participate

in and thereby constitute orderly interactive talk. In terms of broader sociological concerns it is often portrayed as anti-theoretical.

3. Discursive psychology (DP) operates between CDA and CA, using tools and concepts developed in the CA tradition but at the same time being aware of the potential patterning of empirical findings into broader themes or 'repertoires'. Some workers in the DP tradition are also concerned with subjectivity in discourse.

Critical discourse analysis

Analyses of texts that have as their starting point a belief that those texts can reveal deep structures of society, power and mystification have been important in the development of CDA. Writers influenced by Marx, such as Fairclough (1995) and Parker (1992), understand language, or language use, as structured to effect the establishment, maintenance and furtherance of class oppression. In this tradition, the discourse being revealed in particular texts is exactly that of class oppression, so that typical analyses focus on newspaper or television news reports and endeavour to show how the language used systematically favours particular interpretations and renders others less available. Marxist approaches to any subject are useful in social science as they serve to show what a critical realist account of that subject would look like. However, they do tend to rely on a principled but untestable assumption that certain things, be they economic or social, are unproblematically available as explanatory resources. For example, Fairclough (1995) analyses the language used in newspaper reports of 'the drugs war' using tools from the functional grammar of Halliday (1985). He then uses cited academic texts to support a claim that "the news media can be regarded as covertly transmitting the voices of social power-holders" (p163). This claim regarding the social order is then used to explain the syntactic and other patterns found in the news reports. As Fairclough himself notes, there is a need to "map systematic analyses of spoken or written texts onto systematic analyses of social contexts." (p187). Apart from the rather naïve view put forward of textual interaction (the use of the verb 'transmitting' reminds us of Shannon and Weaver's

(1949) closed system information theory), the use of the verb 'map' seems an inadequate way of describing what must certainly be controversial practices. Other writers, such as Kress (1985), deploy more sophisticated models of interpretation, including notions of genre and of multiple discourses in play in any specific text. Nevertheless, two problems remain for such realist socio-economic accounts, and they are these. Firstly, what, if anything, excludes the texts of Marxist discourse analysis from analysis? That is, what is the status of CDA within Marxist theory? Marxist analysts do have recourse to a distinction drawn by Althusser (1971) between real science and ideological practices, but this is difficult to sustain against this kind of reflexive turn. Secondly, in seeking to explain people's utterances by reference to an already-elaborated theory, analysts can surely (and somewhat ironically) be accused of a certain "theoretical imperialism" (Schegloff 1997). As Garfinkel (1967) so caustically noted, people are not 'judgmental dopes', merely acting out the roles allocated for them in some theory.

CDA informed more by Foucault than by Marx is, perhaps, more influential in this thesis. As noted above, Foucault's work includes histories (or 'genealogies') of social institutions such as the clinic and the prison, which produce discourses of power as a part of their operation. Hence, although in Foucault's work particular texts are analysed to reveal the discourses in play in them, these are not the simple 'interest'-based explanations of Marxist analysts. For Foucault, particular texts instantiate, perform, enact or construct the discourses in play within them, discourses that are a part of particular institutional regimes. Hence, what is being done is rather more subtle than the realist accounts of Marxist analysis, while at the same time retaining a (changed) view of context. Individual texts, on this version, are implicated in an inter-textual and material weave that forms their context. (As we shall see, what constitutes the 'context' for any instance of language use is controversial.) For example, Silverman (1987) shows how those involved in adolescent diabetes care (adolescents themselves, their parents, doctors, and other health workers) make use of a medical discourse in constructing a care regime. This regime includes both surveillance and, importantly, the construction of the adolescent as a free and responsible subject. As Silverman (1987 p225) notes, "what Foucault calls 'the universal reign of the normative' refers to how effects of power are

least visible when free subjects define and assess themselves through professionally-defined bodies of knowledge". Because individuals in this approach are said actively to participate in the discourses or techniques that constitute them in particular subject positions (for example, 'patient'), and because discourses are said to be identified empirically from studying instances of language use, then this type of CDA is not so susceptible to the charge of 'theoretical imperialism' as Marxist analysis. However, the theoretical concerns of the researcher do play a part in characterising the analysis, so that the charge cannot be wholly dismissed. I return to this issue below in addressing the claim of conversation analysis to be wholly empirical and therefore methodologically prior to, for example, post-structuralist approaches. However, there remains also the question of reflexivity. In response to this question, Foucault termed his work 'genealogy' rather than 'history', reflecting the inevitable relevance of current concerns, including methodological ones relating to analysis itself, to any analysis of past events. Nevertheless, such questions suggest that any inferences relating to putative macro structures such as discourses need to be justified by reference to data, and the empirical methods used need to be robust.

Conversation analysis

Already introduced above, CA stems from the work of Harvey Sacks (1992a, 1992b). It takes advantage of the technology of the tape recorder to enable researchers to have access to the fine grain of interactive talk. These recordings are supplemented by transcription conventions (Psathas and Anderson 1990) by which such matters as intonation and pauses are set down on paper. Interactive talk is analysed from the recordings and transcripts to reveal the immensely complex, indexical, reflexive and micro-structured ways in which everyday interactions occur. This is described as a craft skill (Potter 1988), in that it is the complete opposite of the conventional academic skill of 'reading for the gist'. This craft skill involves attending to the two characteristic features of CA:

1. The persistent question of CA is ‘why this now?’; that is, what purpose does this particular utterance, timed, phrased and intoned in this particular way, serve at this point in the interaction?
2. The only empirical warrant for answers to the above question lies in the interactional sequence in question; many answers are possible, the relevant ones are those that participants in the interaction demonstrably orient to subsequently in the sequence.

The question of relevance, noted in (2) above, is an important one. Some advocates of CA (Schegloff 1997, Wooffitt 1992) hold a strong view that the only relevant contexts available to an analyst are those oriented to by the participants in an interaction. This orientation does not have to be an explicit reference, but it does need to be demonstrable (for example, Sacks 1992a: 590). Thus, if gender, for example, is not oriented to by the participants then it cannot be used to account for aspects of their interaction. This is in contrast with the position of CDA, which stresses inter-textuality as a condition of language use. It is difficult to see how the purely empiricist position of CA can be held in practice because, for example, practices such as transcription labelling and introducing the data to the reader necessarily compromise the position even before analysis can begin (Billig 1999a, 1999b). This is taken further below. However, good practice must be to look first to the interaction for clues as to what contexts are relevant.

Advocates of CA sometimes make two other claims that are germane, firstly that conversation itself is somehow foundational to other kinds of interactive talk and, secondly, that conversation analysis is a technical procedure that is methodologically prior to other forms of analysis. The first of these claims is pertinent because the data used in this thesis is not conversation, it derives from interviews. The second claim is relevant because I wish to analyse the interviews with a prior understanding of my analytic foci, which are the roles of scholarly communication, the information chain and technology in those interviews. I therefore would like to spend a little time on these claims.

Is conversation ‘foundational’?

Conversation analysts such as Schegloff (1999c), Widdicombe (1998), Wooffitt (1992), Heritage (1984) and Edwards (1997) explicitly claim that conversation has foundational or bedrock status compared with other types of interactive talk. Furthermore, the claim is implicit in other CA work, such as that of Atkinson and Drew (1979). The claim is even implicitly supported by some critical discourse analysts, such as Fairclough (1996) who notes that conversation is, in Habermas’ terms, a lifeworld rather than a system discourse type. In specific terms, the claim seems to be that ordinary conversation is the only speech-exchange system (Schegloff 1999c) that is in some way generative of practices of interactive talk, and that other systems merely adapt or formalise some of these practices. As Wooffitt (1992 p51) puts it, in institutional and other non-conversational types of interactive talk, speakers “adapt procedures which are recurrent features of everyday talk to the specific particulars of the circumstances”. But the claim is stronger than this, for if conversation is foundational, then there should be no features of other speech-exchange systems that are not clearly derived only from features of ordinary conversation. If there were such features, then they would indicate that speech-exchange systems other than that of ordinary conversation were generative of original practices of interactive talk and so, in their turn, these other systems could be considered ‘foundational’. This would seem to compromise the meaning of the term ‘foundational’. To summarise, the step argued for by some conversation analysts is that, not only is there an array of speech-exchange systems (each of which has its own way of managing, for example, turn taking), but that one particular speech-exchange system, conversation, is foundational to all others. It is this latter step that I now address.

The first argument that I wish to address is that conversation is foundational because it is paradigmatically the speech-exchange system wherein turn allocation is organised endogenously by participants using the resources they can bring to the interaction in the turns themselves. As Sacks et al (1974 p711) note, the rule-set for conversation “frees turn-distribution for manipulation by such interests as can be realized with the distribution of turns.” In other speech-exchange systems, it is argued, turn allocation is at

least partly decided outside any particular interaction. Hence, for example, turns in a courtroom exchange are tightly scripted and deviation from the script can attract severe and demonstrable sanctions. However, there are two related problems with this argument. The first problem is relevant if the argument is taken to refer to conversation as an empirical phenomenon. Interactional constraints on turn allocation in courtroom interaction are easy to identify by their formal status, often written down, and (virtually) uniformly adhered to: Whether or not constraints similar in kind, though not so obvious, operate on what is called ordinary conversation (or some subset of it) is a matter of empirical investigation rather than assertion. Such investigation by conversation analysts has shown innumerable ways in which turn allocation is often organised in ordinary conversation, and it is surely for those who wish to make the foundational claim to show how such organisation is different in kind (rather than in obviousness) from the formal constraints of the courtroom. The second problem with the argument that conversation is foundational because of its specific turn allocation system is relevant if the argument is taken to refer not to conversation as an empirical phenomenon but as one pole on a spectrum where any actual instance of interactive talk lies between the poles. Several writers suggest that this is the idea of conversation that they mean to imply is foundational. For example, Edwards (1997 p84-5) notes that “there is a kind of primacy given in conversation analysis to casual talk... [which is] a common sense category... [that]... may not be easy to define technically, nor easy to find a pure, unadulterated example of it”⁷. Schegloff (1999a) also seems to imply that he is referring to conversation as a type of organisation rather than as an empirical phenomenon when its foundational status is in question. This characterisation of conversation as a system conceptually distinct from any instance of practice is, however, highly problematic. As Heritage notes (1984 p234) Sacks himself criticised the use of ideal types such as this in sociology because “they necessarily blur the specific features of the events under investigation. The result, he argued, is that sociological concepts and generalisations can have only a vague and indeterminate relationship with any specific set of events”.

7. Edwards later (1997: 90) goes on to note that “in ethnomethodology and conversation analysis, the status of common sense is that it is the object under study”. It is not clear whether that study excludes the common sense category of conversation.

The second argument that is used in support of the foundational status of conversation is that ordinary conversation is developmentally prior to other kinds of talk. Thus, it is argued that as we grow up the first kind of interactive talk we have is with “family, within peer groups, neighborhoods, communities, etc” (Schegloff 1999c p413).

Institutional and other kinds of interactional talk that are not conversation come later, and are created out of the organisational practices of mundane initial interactions. However, it is difficult to see how such a thoroughly sociological or psychological account of conversation could sit well with ethnomethodological empiricism. From a conversation analytic perspective, the existence and relevance of such entities as the family, peer groups and so on would have to be demonstrated from data derived from the children who were said to be learning conversation. Furthermore, this argument is also susceptible to that above, since families can certainly be understood as institutions and the talk within them described as institutional. As Billig (1999b p574) notes, “there is no point of sociological neutrality”, and this applies as much to learning conversation as to practising it.

The third and final objection to conversation as the foundational speech-exchange system relates to the very idea of a foundational type of interactional talk. The idea seems to imply mechanisms whereby certain practices of a particular speech-exchange system and not others are selected to be adapted to constitute another, derivative system. This is a different and stronger claim than one that stated that features of one system might overlap in another. It seems to imply that there exist some requirements relating to the derivative system, by reference to which conversational practices can be adapted. As Schegloff⁸ says, “other speech exchange systems ... appear to be shaped by the adaptation of the practices and organizations of ordinary conversation to their special functional needs, legal constraints, etc.” (1999c p415). However, it is not clear how any empirical data might relate to these functional needs without an ethnomethodological analysis being

8. Persistent references to Emmanuel Schegloff’s writings in this chapter are not intended to imply that they are necessarily representative of conversation analysis, just that they are well expressed and that he is a highly respected source on the subject.

wholly tautological. For example, Heritage (1984) notes that “institutional interaction tends to involve two related phenomena: (1) a selective reduction in the full range of conversational practices available for use in mundane interaction; and (2) a degree of concentration on, and specialization of, particular procedures which have their ‘home’ or base environment in ordinary talk.” (1984 p239-240) Characterising ordinary talk as a home environment surely prejudices exactly the issue at stake. Of course, should the context (Schegloff’s ‘functional needs’) be analysable outside participants’ orientations then the problem disappears. Furthermore, Schegloff’s argument seems to imply that conversation (or whatever speech-exchange system is defined as foundational) has no functional needs. Again, it would depend on whether the phenomenological or the ideal-type understanding of conversation were in use but, in either case, the assertion that conversation is unmotivated, or has no functional needs, seems to stand in need of support.

The argument that conversation is the foundational speech-exchange system seems flawed. This implies that research interviews, which is what this thesis has as data, need not be analysed merely as derivatives of ordinary conversation but can be treated in their own terms.

Is CA a technical procedure that is methodologically prior to other types of analysis?

This is a complex claim, and is built up from several steps. Firstly, conversation itself is characterised as local and technical, as opposed to being part of larger historical or political structures. This implies that analysis of conversation, to be appropriate to its subject matter, has to be technical and focused on the interactional detail. Hence, a second step is to show that this is so. The third step is to show how formal or technical analysis is methodologically prior to other types of analysis.

The characterisation of conversation as foundational is not the only contestable claim made about it by conversation analysts. Another, perhaps related, claim is that

conversation is made up of small-scale, technical practices undertaken by participants. The two parts of this claim, scale and technicity, are complementary in that their opposites, that which they serve to configure conversation against, are characteristics of the alternative, post-structuralist approach outlined above. The technical claim is widely articulated. For example, McKinlay and Dunnett assert it in relation to identity work: “People employ a variety of discursive mechanisms in order to solve identity-related problems which arise in interaction with others” (1998 p36). The claim of scale is also common. For example, Widdicombe (1998 p202) states that “there is a vast difference between the local projects in which speakers are engaged and the broader theoretical and sometimes political projects of social constructivists”. The latter example explicitly contrasts the claim of scale with alternative, structural analyses. This is echoed by Wooffitt (1992 p60), who additionally associates the claim of scale with conversation analysis: “Conversation analysis has revealed that the activities accomplished in talk are located at a sequential and interactional order of detail for which the notion of linguistic repertoire cannot provide an account”. That there are important practices in interactive talk at the most detailed levels of that interaction is hard to dispute, but this does not imply either that other, larger scale practices are absent or that the detailed levels of interaction are divorced from such larger scale practices. Following ethnomethodological principles, we should attempt to see what practices participants orient to, rather than limiting the subject matter *a priori*.

Given that conversation analysts do tend to characterise conversation as comprising local and technical practices, how do they describe their analysis? The ‘technical’ vocabulary of conversation analysis is striking, and is both implicitly and explicitly used to render the analysis appropriate to the subject matter. For example, Schegloff (1999c p417) notes that “formal resources are like a reservoir of tools, materials and know-how from which particular academic analytic undertakings can draw in inquiry, because practising interactants draw on them in concertedly constructing what transpires in interaction. That is why disciplined control of these analytic resources should be part of any competent analyst’s tool kit”. The technical, empiricist vocabulary of conversation analysis has been subject to intensive and inconclusive debate in the literature (Billig 1999a, 1999b;

Schegloff 1999a, 1999b). The inconclusivity of the debate may be due to different understandings of the terms; a confusion between the semantic content or ideational aspects of the technical vocabulary on the one hand and what it does interactionally on the other hand (Halliday 1985). As we have seen, the technical vocabulary serves to mesh the form of the analysis with the form of the subject matter, and so it cannot easily be debated outside those terms. However, the interactional function of the technical vocabulary might be concerned with how it differentiates CA from more sociological concerns.

The third and final step in asserting the methodological priority of CA is to show how a technical analysis comes before a sociological one. This is a delicate narrative to perform, since the technical analysis has to be characterised as one that both does and does not change the subject matter that is then available for sociological analysis. A criterion of relevance mandates that a technical analysis is necessary if it is to be a part of any methodology (whether prior to other analyses or not), and to be necessary it must be consequential; it must achieve something. However, a criterion of transparency mandates that sociological or other subsequent analyses have access to their subject matter without prior alteration. How is this balance achieved? As noted above, Schegloff (1997; 1999c) argues strongly that conversation analysis represents a set of tools for the analysis of endogenous features of conversation, and that such an analysis is a prerequisite of any other, more theoretically inclined analysis. “You need to have technical analysis first, in order to constitute the very object to which critical or sociopolitical analysis might sensibly and fruitfully be applied.” (1997 p174). Hence, a technical analysis is necessary to convert data into a set of practices that are susceptible to theoretical analysis. Thus, the first move must be inductive, and it is on this basis that the claim for methodological priority is based. This thoroughgoing empiricism is problematic and reminiscent of other instances of what might be called epistemological puritanism, such as Grint and Woolgar (1995) with respect to constructionist approaches. Schegloff (1999b p578) claims that the purity of the inductive project is maintained because conversation analysts “do not bring tasks to the data, much of the work starts in ‘unmotivated observation’, analytic workshops or ‘jam sessions’.” The craft skills involved in ‘unmotivated observation’ are

“a key component in the training and progressive competence of new CA workers” (Schegloff 1999b p578). This kind of account, wherein inferences are said to come directly from the data, is characteristic of what Gilbert and Mulkay (1984), when studying scientists, termed the ‘empirical repertoire’ (see below). However, the fact that ‘unmotivated observation’ has to be learned suggests that conversation analysts are not dealing with the facts as they are but with material configured to work with a particular (if tacit) set of disciplinary practices⁹. Furthermore, the selection of this material is surely based on some kind of motivation; would a shopping list be as good as a transcript? Hence, just as it was difficult to maintain a hierarchy between conversation and other kinds of interactive talk, so it is difficult to maintain a hierarchy between empirical and other kinds of analysis.

Conversation analysis: summary of background

CA as an ethnomethodological approach to the analysis of interactional talk has a large number of achievements to its name. Findings such as the prevalence of category entitlements, preference structures, adjacency pairs and so on (explained below) are useful in that they offer candidate understandings of how it is that any particular instance of interaction works. However, advocates of CA make further claims for the discipline, that both its subject matter and the analysis itself are somehow foundational, one for other kinds of interactive talk, the other for other kinds of analysis. Both of these claims are deeply problematic and, furthermore, are unnecessary to the practice of CA as one set of candidate understandings among others.

9. As an aside, it is perhaps worth noting that the complementary repertoire to the ‘empirical’ in Gilbert and Mulkay’s (1984) work was what they termed the ‘contingent repertoire’, which was used by scientists to explain away the alleged errors of rivals. In its ascription of social interests to advocates of alternative approaches, it bears a striking resemblance to some of the ways in which conversation analysts criticise constructionist, post-structuralist and other non-conversation analytic perspectives (see the quote from Widdicombe (1998: 202), above in the main text).

Conversation analysis: candidate understandings

In this section I shall briefly review some of what CA terms 'tools' and which I have termed for the purposes of this section 'candidate understandings' of particular instances of interactional talk.

- **Preference structures:** This describes the way in which certain types of utterance, such as an invitation, call for one of a number of responses (an acceptance, a rejection, and so on), but that these responses are more or less preferred. Lower preference responses are marked in interaction by such features as pauses, delays and hesitations in their delivery (Heritage 1984), and are often accompanied by accounts (see below).
- **Adjacency pairs:** A similar and more basic understanding than preference structures; merely notes, for example, that questions expect answers and that sequential trouble is caused when they are not adequately forthcoming.
- **Accounts:** When descriptions are offered, the speaker commits themselves to a greater or lesser degree to their veracity, relevance and so on, and this has certain implications in terms of how they are offered. Moreover, such descriptions are offered in order to do things, such as to make or reply to invitations (hence the relevance criterion). These are accounts and the speaker is accountable.
- **Category entitlement:** The idea that one way to enhance the veracity, relevance and so on of accounts and descriptions is to claim to be a member of a category that should know about such things. The eyewitness is a common category used for this work (Potter 1996). Of course, the entitlement of others can be undermined to reduce the veracity of their accounts.
- **Repairs:** Where interactional trouble is caused by, for example, a question not being adequately responded to with an answer (perhaps because it wasn't heard as a question), certain repair practices are usual to mend the sequential order.
- **Membership Categorisation Devices (MCD)** are categories of related and mutually defining words or phrases such as 'sister - brother' and 'sister - comrade'. Once

established, an MCD acts as a community against which the reader and other discursive entities can be aligned (Woolgar 1996)

- Three-part lists (Atkinson 1984) and other rhetorical moves such as ‘show concessions’ (Antaki and Wetherell 1999) are effective in bolstering the effectiveness of an account, or in undermining it.
- Contrastives are a means of constructing the terms of an account, including what is relevant to the purpose of the account, in that they suggest what is relevantly variable, or contrasting, and what is relevantly constant. They offer one approach to ‘ontological gerrymandering’ (Woolgar and Pawluch 1985), which describes the process of strategic topicalisation that is probably inevitable in accounting.
- Modals are qualifiers, words or phrases that can intensify or qualify a part of an account or, more accurately, either attend to the conditions of its production (negative modalities) or to its consequences (positive modalities) (Latour 1987).

These and other candidate understandings operate at the local interactional level and offer analytic leverage at that level. However, as I have argued, there may be more general features of the data within which these understandings operate, and these may relate to post-structuralist concepts such as discourses and subjectivity, as well as to local interactional business. This synthetic approach is the hallmark of what has become known as ‘discursive psychology’, and it is to this approach that I now turn.

Discursive Psychology

In what sense can discourse be understood in or through social psychology? Perhaps the seminal work in this field is Potter and Wetherell’s *Discourse and Social Psychology* (1987), which has acted as a defining text for a program of research. Potter and Wetherell trace the discourse analysis they describe therein through three influences; speech act theory, ethnomethodology and semiology. In Potter’s later account (1996), speech act theory has been replaced by the social studies of science, or SSK (see Chapter One). It is notable that these influences transcend the simple binary divide set up above

between empiricism and (post)-structuralism, or between bottom-up and top-down theorising. Interesting questions arise as to how this transcendence is managed in the book and in the program of work that has followed it.

Given the contemporary concerns, theories and methods in social psychology departments, it is perhaps unsurprising that discourse analysis is often defined against cognitive science. The general cognitive theory of language use is spelt out by, for example, de Beaugrande, who describes language use as having goal planning at the deepest level, followed by “ideation, conceptual development, expression, phrase linearization, and sound-letter linearization” (1985 p53). Although de Beaugrande claims that “experimental methods can disassociate them”, it is important to note that the preceding list carries no implications of temporal sequence. The sense of depth indicated refers to a measure of how much each level affects the outcome. The problem with this approach, of course, is that the only evidence for any of the levels is discourse (‘the outcome’), which must, on the definition given here, involve all the levels. Therefore, how is one to judge the effect of any one level on the ‘outcome’? The discourse analyst response to such issues as these within cognitivism is, unsurprisingly, to recast them as varieties of discourse. In essence, what is bracketed off is what goes on under people’s skulls, and ways are found to account for what is left. As a result, the response from cognitivists is that such strategies represent a return to a bankrupt behaviourism (Slezak 1989).

Apart from the sheer name-calling and disciplinary boundary wars involved in these debates, the issue at stake is analogous to that in another post-Wittgensteinian dispute, this time between sociologists and ethnomethodologists (Bloor 1992; Lynch 1992a, 1992b). The issue at stake in both is whether an internalist or an externalist explanation of discourse is required. That is, whether particular instances of language use can (only) be understood solely in terms of their relation to other instances of language use, or whether such instances are affected by other entities or relations, such as those posited by sociology or cognitive science (Woolgar 1987). Traditional sociology, social psychology and cognitive science fall on one side of this divide and, interestingly, both

ethnomethodology and post-structuralism can be argued to fall on the other. This offers a way both to differentiate discursive psychology from sociological studies and to show how it can synthesise influences from Foucault and conversation analysis, as shown in the programmatic text by Potter and Wetherell (1987).

Whereas the post-structuralist and the ethnomethodological inputs into discursive psychology have been rehearsed above, the contribution of SSK has been only briefly mentioned in the chapter. I shall, therefore, briefly review that contribution.

Discursive psychology and SSK

Discourse analytic techniques were introduced into SSK (see Chapter One) by a group of writers centred on Michael Mulkay. Drawing inspiration from the work of Halliday (1978), these writers sought to identify the different repertoires, or sets of linguistic resources, used by scientists to account for science. The seminal works in this tradition are Mulkay, Potter and Yearley (MPY 1983), which outlines the theoretical case, and Gilbert and Mulkay (GM 1984), which describes a practical example. Taking two examples of sociological work directed toward scientific practice, MPY show how sociological explanations founder when they uncritically take participants' descriptions of the field. MPY suggest that these descriptions should be the topic, rather than the explanatory resource, for sociology. When this stance is adopted, as GM do, scientists can be seen to use two distinct repertoires when accounting for such scientific issues as replication, key experiments and scientific error. A strong normative element is evident in such accounts. What has come to be called the 'empiricist' repertoire consists of a number of linguistic practices that, taken together, enhance the objectivity of some scientific accounts. That is, they construct the accounts as being the result of regulated material agency rather than ad hoc or human agency. Examples of these practices include the following:

- using the active voice for data or events ("the data suggested that...");
- using the passive voice for theory or procedure ("the Martin procedure was used...");

- recruiting independent witnesses, for example by citation.

Use of the empiricist repertoire is conventional in formal scientific reports of research. However, Gilbert and Mulkey also identify what they call the contingent repertoire, which is used by scientists in less formal circumstances in accounts of error or of findings that seem to dispute those of their own research. The contingent repertoire inverts the practices of the empiricist repertoire, imputing agency and interests to people seen to be allied to the competing account.

The relativising effects of this kind of work can be seen in another important paper, McKinlay and Potter (1987), in which a conference debate between two groups of psychologists is analysed. The debate is between the advocates of two understandings of scientific practice, a 'top-down' understanding in which small hypotheses generated from large theories are tested, and a 'bottom-up' understanding in which the testing of small hypotheses leads to the generation of large theory. Again, the empiricist and contingent repertoires are discovered in the psychologists' discourse. The subject matter (psychology research) gives a clue as to the reflexive potential of analysing the discursive features of academic accounts, a matter that is not taken further here (Ashmore 1989, and see Chapter Ten).

Discursive psychology as a method

Many of the programmatic texts in discursive psychology have been taken up with recasting traditional social psychological concerns such as selfhood and identity as discursive practices, achievements or effects. In terms of method, Potter and Wetherell (1987 p175) note that "there is no method to discourse analysis", although they do go on to provide an overview of the main foci of attention. Their stance lies somewhere between that of CA, whose practitioners are trained to develop competence as a disciplinary craft skill, and advocates of CDA, some of whom are more explicit. For example, Parker (1992) offers a 20-point guide to doing discourse analysis. The majority of the main foci of attention in discursive psychology are concerned with techniques to

ensure a discursive rather than a realist reading of the text. However, given the relativising effect of discourse analysis, perhaps the most important focus is on validation, so that I will summarise this and its implications in a little detail. Potter and Wetherell (1987) note four criteria for the validation of an example of discourse analysis. These are:

- (a) coherence: exceptions to the analytic account should be minimised and the account should exhibit validity from the micro to the macro levels of discourse;
- (b) participants' orientation: features of the analytic claims should be recognisable as such by participants;
- (c) new problems: the use of any identified discursive repertoires will throw up problems and the analysis should be able to identify these and the techniques used to cope with them;
- (d) fruitfulness: the analysis should be applicable to new kinds of discourse and show an ability to produce novel explanations.

The classic analytic account from SSK discourse studies, that concerning the empirical and contingent repertoires of scientists, can certainly be shown to fulfil all four of these criteria. However, these criteria are problematic. All but the second might be accused of begging the question somewhat, since what is to count as coherent or new may be precisely what is at issue. Appealing exclusively to participants' criteria would, as Mulkay, Potter and Yearley (1983) have illustrated, be fatal to any analysis. The cause of this problem may be that, in seeking to develop discursive psychology against cognitive psychology, and in sympathy with ethnomethodology, Potter and Wetherell had been understandably focused on micro-levels of interaction and had found it difficult to incorporate the post-structuralist insights acknowledged as being relevant. Something of this was achieved in their analysis of pervasive discursive patterns, such as racist speech (Wetherell and Potter 1992), but Potter's subsequent review of the field (1996) can be argued to have turned further toward CA. Wetherell (1998), on the other hand, has engaged more with post-structuralist ideas and, in particular, has taken on the concepts of the interpretative repertoire and subject positioning to show how CA can be enrolled as one aspect of an analysis that is perhaps more able to satisfy the validation criteria noted above. In this spirit of synthesis, the remainder of this section will introduce three major

themes, informed variously by SSK discourse studies, social psychology, post-structuralism and ethnomethodology, that are central to the analyses undertaken in this thesis, and will discuss how they fit with the various literatures described above.

Three themes by which to structure an analysis

Interpretative repertoires and discourses

The interpretative repertoire was first considered by Gilbert and Mulkey (1984) in their studies of scientists' accounting practices discussed above. When brought into discursive psychology it was defined as "basically a lexicon or register of terms and metaphors drawn on to characterize and evaluate actions and events" (Potter and Wetherell 1987 p138). On this definition, the repertoire is similar to what Fowler (1991) calls a lexical register, about which he notes that "it is presumably part of our communicative or discursive competence to recognize these registers, and to be aware that they mark off socially and ideologically distinct areas of experience: they have a categorizing function." (1991 p84). Further relations between the idea of the repertoire and CDA and post-structuralism are signalled by Parker (1992) who notes that the repertoire is similar to a discourse, or a coherent – though not necessarily consistent – system of meanings. This is still some distance from the concept of discourse as it appeared in early Foucault, though, since that concept included linguistic and material practices. Nevertheless, it is clear that this idea of a repertoire is some way from being anything that would be recognised in CA. Its tie with CA has been shown by Wetherell (1998), who demonstrates how participants make use of patterned categories of resources in order to render their accounts effectively. Such a patterned category of resources is a repertoire in the sense that it is "a culturally familiar and habitual line of argument comprised of recognizable themes, common places and tropes (doxa)." (Wetherell 1998 p400). Repertoires, then, have semantic content: they need to in order to do the interactional business that participants use them for. They are not simply categories of words and phrases, but linguistic resources that can be combined to make or challenge accounts. In doing so they can form the semantic content of 'candidate understandings' such as those

outlined above, such as category entitlements and contrastives. Analysis of repertoires, therefore, needs to start with participants' understandings of what is going on as they are revealed in the sequential organisation of the interaction, but can then use these understandings to support inferences about the resources available to the participants.

In the analyses offered in this thesis, I have revealed a prior interest in the topics of technology, the information chain and scholarly communication. This runs counter to the inductive principles of ethnomethodology. However, having designed the interview schedule with these issues in mind, and having been a participant in all of the interviews to be used as data, I am reasonably confident that the relevant categories were used in the interviews. Whether and how they formed lexical categories (such as those implied in Chapter One) or repertoires is an empirical question addressed by both discourse analysis and, elsewhere in this thesis, co-word analysis. The latter, being limited to the speech of the interviewees, also addresses the question of whether lexical categories representing the three topics mentioned above were used by interviewees.

Subjectivity and deixis

Four literatures overlap in this theme, two of which have been discussed above. Firstly, from post-structuralism there is the idea that one result of the practices of any discourse is the production of possible subject positions. The usual example is that 'patient' is a subject position within a medical discourse. Secondly, from conversation analysis there is the idea of indexical reference or deixis. That is, reference within interaction to the circumstances of that interaction. Thirdly, there comes from Goffman (1981) the notion of 'footing'. Fourthly, from functional grammar we have the idea of transitivity. Since these last two have not been introduced so far, I shall offer brief descriptions now.

Footing

Footing is the way in which discursive roles are allocated within an account. Goffman's (1981) notion of footing formed a part of a larger theoretical approach to the presentation of self, and emphasised the possibilities in talk of distinguishing between, for example, the initiator and the utterer of an utterance. That is, between the entity that composed the message and the entity who conveyed it in a particular instance. The question of footing categorisation has been addressed by Levinson (1988), who notes that a decomposition of the naïve categories of 'speaker' and 'hearer' that is "quite adequate for most purposes" (1988 p171) is that shown in Table 1:

Table 1: A system of basic categories of footing (from Levinson 1988)

Basic categories	Explanation
Source	Informational / illocutionary origin of message
Target	Informational / illocutionary destination of message
Speaker	Utterer
Addressee	Proximate destination
Participant	a party with a ratified channel-link to other parties

Levinson goes on to elaborate this decomposition of the 'speaker' and 'hearer' categories and to support the elaboration with examples from several languages. Readers familiar with Shannon and Weaver's (1949) classic information theory model of communication may be struck by the parallels between it and Levinson's schema and, although Goffman's disaggregation of a naïve model of discourse fits into his more general approach to the study of the self, it suffers from some of the same problems as information theory. Principal among these is the question of what counts as evidence in tagging (or even identifying) discourse participants with one or more footing at any one point in an interactive sequence of talk. Nevertheless, some of Levinson's distinctions are useful, especially that between speakers identifying themselves as the source and as spokespersons.

Transitivity

The final literature that I shall consider with respect to subjectivity in the interview transcripts is related to those discussed above, but draws heavily on the linguistic literature, especially the functional grammar of Halliday (1985). Halliday's division of discourse events into the ideational, the interpersonal and the textual may be overly simplistic, but it does allow him to develop the key idea of transitivity as an ideational or semantic structuring of the predicate. This has been taken by critical discourse analysts such as Fowler (1991) to refer to the ways in which clause structure constructs a recognisable situation in a particular way. For example, 'Boy shot by PC' and 'PC shot boy' convey similar information, but they centre one's attention on different entities. Fowler specifies overlapping syntactical and other linguistic devices that are available in English to temper or hide attributions of agency within sentence structure, the use of the passive voice being only the most obvious. However, and as with footing, the question arises as to what counts as evidence for transitivity effects.

Synthesis

How, then, can we synthesise the post-structuralist 'subjectivity', the ethnomethodological 'deixis', Goffman's 'footing' and relevant aspects of Fowler's 'transitivity'? Firstly, and as suggested above, both footing and transitivity need to be brought under ethnomethodological discipline. That is, they need to be made to reference participants' orientations as demonstrated in sequential interaction, rather than analysts' interpretations. A speaker's footing is what the participants demonstrably understand it to be. The transitivity of a phrase is relevant if it is picked up by participants as relevant. In this sense, the common ground between footing and deixis is likely to include those indexicals whereby the speaker constitutes her/himself as a voice in the interaction. For the sake of simplicity of focus, I have taken such events as being those in which the speaker consequentially uses 'I' or 'we'. The common ground between transitivity and deixis is likely to include instances wherein clause structure, perhaps especially the use of

the passive and similar constructions, becomes relevant for participants. Again, for the sake of simplicity I have taken such instances as being those in which the speaker uses 'you'.

What is the role of post-structuralist theory in this synthesis? Again, I return to Wetherell (1998), wherein the notion of subject positions is criticised as being prior to particular instances of interactive talk. To avoid the otherwise legitimate charge that post-structuralist theory treats participants as 'judgmental dopes' (Garfinkel 1967) and discourse as somehow having agency, it is necessary to understand subject positions, like repertoires, as resources available to participants. Participants can use such subject positions as a resource in supporting or challenging accounts. Hence, in the proposed analyses of 'I', 'we' and 'you', the focus should be on how these words mark the deployment of subject positions to do interactional work at that point in the data.

These marker words, 'I', 'we' and 'you', have been discussed by Sacks (1992a pp144ff, 163ff, 333ff) and other writers in terms of the interactional practices in which they can be implicated. This literature is referenced at appropriate places in the analysis.

Social interests

Interests explanations have been common in social science, where they account for practices by reference to the material, psychological or social interests (or stake) of relevant actors. This type of explanation is the topic, rather than the resource, of discursive approaches. That is, from the CA perspective the focus is on occasions when participants understand each other as invoking interests in the support or challenging of accounts. For example, Antaki and Horowitz (2000) show how one speaker was characterised by a second as having an interest in the story being told by the latter, and this characterisation was heard by both parties as challenging the rights of the first speaker to hear the story in a particular way. Generally, being understood to have an

extra-discursive stake in a particular account will undermine one's entitlement, since the stake will be understood as an 'ulterior motive'. The management of interest, then, is a key perspective on how accounts are made and heard.

The analysis of interest management is a powerful analytic perspective, and can be argued to be the general case of many other discursive features described above. For example, Potter (1996), in his more conversation analytic turn, uses interest management to explain the use by scientists in Gilbert and Mulkay's (1984) study of the empirical and contingent interpretative repertoires. Thus, whereas repertoires were a major feature of Potter and Wetherell (1987), their place has been taken in Potter (1996) by interest management. Another example of the applicability of interest-based analysis would be where a speaker could effectively enrol the extra-discursive interests of legitimate others. This can work as a part of a category entitlement, since it casts the speaker as being able to speak for others; as an expert on their concerns. Furthermore, such enrolment offers a picture of the interests of the speaker that excludes any personal stake that could be used to undermine the account. Hence, any interests-based challenge to the account would have plenty to do in unpicking its interest management work. This kind of interest work was a major focus of the analyses.

Summary and concluding remarks

In this section I have outlined two academic traditions, one structuralist and post-structuralist, the other ethnomethodological. Each of these leads to a particular kind of discourse analysis; indeed to a particular view of what discourse is. Post-structuralist writers, critical discourse analysts, understand a discourse as an array of linguistic and material practices, some of which may be apparent in a particular instance of language use. Ethnomethodologists, conversation analysts, understand discourse as the fine grain interactive ordering of particular instances of language use. Discursive psychology can be considered to be a synthesis of these two approaches.

Of course, as with any synthesis, tensions remain. However, much work has been possible within this synthesis (for example, Wetherell and Potter 1992, Wetherell 1998, Lemke 1999, Johnson 1994), and it would appear to be a potentially fruitful space in which to position the discourse analytic sections of the empirical part of this thesis, Chapters Six and Eight. As with any approach, however, there may be questions that cannot easily be addressed from within the discursive perspective.

Chapter Three: Co-word analysis

Introduction

The purpose of this section is to embed the methodological principles and practices employed during the co-word-analytic parts of this thesis in the academic writings and controversies relevant to them.

There are many ways of using text-based data in research, some of which constitute analysis. The particular approach chosen depends on the theoretical stance taken, the purpose of the analysis and the nature of the data (which, of course, should not be independent of each other). Chapter One noted that one theoretical perspective for this study was Actor-Network Theory (ANT) and that one methodology associated with that perspective is co-word analysis. The purpose of the analysis was to specify the constitution of and relationships between the ideas of scholarly communication, the information chain and technology, and the data (as detailed in Chapter Four) was textual. The actor-network is a “ruthless application of semiotics” (Law 1999), and co-word analysis is specifically and exclusively concerned with the patterning of signifiers, so that this chapter is concerned with how ANT informs a co-word methodology and how that methodology informed this study.

Co-word analysis and ANT

How can the ANT perspective inform a methodology that identifies and analyses a system of signs? We can take a cue from a branch of Callon’s work, which has seen him develop a scientometric method known as ‘co-word analysis’ (Callon, Law and Rip 1986). This has been used to map the relationships between networks of keywords used in databases to describe scientific articles and patent descriptions (Callon, Courtial, Turner and Bauin 1983, Callon, Courtial and Laville 1991). Other researchers have taken

the work on. Palmer (1999) has applied the method to an analysis of interdisciplinarity, and Coulter, Monarch, Konda and Carr (1996) have used it to map changes in research patterns in the field of software engineering. The relationship of this approach to ANT is in general terms its emphasis on an inductive process of textual analysis and interpretation. The results of co-word analysis can be seen in some sense as representations of changing actor-networks as they are 'cut' (Strathern 1996) or frozen in the published scholarly literature. In addition, particular ANT concepts are used, for example, an obligatory passage point in an actor-network would be represented on a co-word diagram by an index word co-occurring completely with all other relevant words. Such words may refer to actants or intermediaries in an actor-network, although these inferences are not drawn from the words' accepted meanings but from their relationship to other words in the text; their co-occurrence. Hence, no *a priori* assumptions are made as to the meaning of the words. This approach to analysis has been discussed by Teil and Latour (1995), who note that it represents a radical attempt to realise what they call the 'Hume-Condillac Machine', a revival of the inductive empiricist programme of Hume and Condillac, or an inference engine. They note that "the only inference engine that the Hume-Condillac machine needs is a calculation of co-occurrences; in the scale model of the machine this is a co-word network." That is, an accurate model of the categorical inferences available in a text can be formed by the use of co-word analysis. Perhaps taking a cue from this ambitious statement, the co-word method has been extended beyond the field of scientometrics by Monarch and Gluch (1995), who have used it to map the significant perceptions of risk in a software development programme, taking their data from interviews with those involved. Such 'data-mining' approaches to visualising collections of textual material are becoming more common, and (as both described and anticipated by Teil and Latour (1995)) software is becoming available to support them. However, is this extension of the programme justified?

The relationship between the actor-network and co-word analysis is apparent in science because of the special status of the text in scientific communication. Scientific texts are structured into a formal rhetoric wherein heterogeneous entities (laboratories, chemicals, theories of disease, and other texts) are enrolled by naming them according to certain

rules. Whether co-word analysis is applicable outside this narrow realm of texts is an important question, and one that this project seeks to investigate. Certainly, it has been applied to examples of texts other than scientific articles, for example by Monarch and Gluch (1995). They note that the terminological networks resulting from a co-word analysis of texts, if appropriately interpreted, “show relationships and patterns among concepts that are both explicit and implicit within the text being analysed”. However, this work must be considered speculative without further support.

Co-word analysis in other fields

Information retrieval

The databases on which Callon and others were basing their scientometric analyses were designed by skilled information scientists, not for such analyses, but to enable scientists to be able to locate references that would be useful to them. To do this, an extensive body of theoretical work had been produced by the mid 1980s (Willett 1988). Included in this was work on Boolean searching of keyword indexes. A Boolean ‘and’ operator is clearly analogous to a single unit of a co-word analysis and, with the growth of the internet, full-text resources and virtual reality imaging technology, has become one basis for data representation and mining. Many popular web search engines can undertake relevance ranked ‘and’ searches, and the results of these can be considered to be the view from a particular point (defined by the query terms) in a co-word network.

In addition to this, scientometric work continues using co-word and co-citation analysis. For example, Chen and Carr (1999) has mapped the hypertext literature using co-citation analysis and virtual reality imaging techniques. Citations are here being used as no more than descriptors of documents (in the same way as keywords would be), so that the resulting networks are closely analogous to co-word networks.

Linguistics

As 'collocation', co-word analysis has been pioneered in linguistics by Sinclair (Sinclair 1991, Sinclair et al 1998), who has developed analysis techniques appropriate to the huge and growing Cobuild English corpus of natural English language. Sinclair notes that grammatical rules are insufficient to achieve meaning in a text, and that an idiomatic theory is required whereby the choice of the next word in any text is constrained by various (idiosyncratic or social) conventions. These semantic idioms, it is claimed, can be identified in natural language corpora as co-occurrence frequencies between words at above or below that expected by chance alone. This empirical approach has been geared to micro-analyses of particular words in specific corpora, such as 'back' (Sinclair 1991) and 'woman' (Nakamura and Sinclair 1995). This has limited the results to those traditionally of interest mainly to linguists, although the latter work does suggest that the approach could be understood as a part of a textual analysis toolkit that would also include a keyword selection procedure and tools to combine analyses of a number of keywords. Clearly, the results from such an integrated methodology would go beyond merely identifying semantic idioms connected with a particular word, and (depending on the number and range of keywords chosen) would begin to say something about the corpus as a whole. The results could be a semantic network representation of some of that corpus. This, then, is support for extending the co-word project beyond scientific or otherwise formal texts and into natural language.

Domain analysis

McGreevy (1997) describes an approach called QUORUM that he has developed to assist in domain analysis, for example, in the analysis of aircraft flight incident reports (1996). This method is applied to the generation of domain-specific software. He reviews a number of approaches to such generation (1995) including:

- object-oriented entity-relationship modelling;
- semantic networks - the formal analysis of declarative sentences;

- formal verbal data analysis - knowledge elicitation and modelling;
- content analysis - mapping text onto socio-political themes;
- network methods - such as Pathfinder, which uses data from paired comparison experiments.

Although acknowledging value in all of these, McGreevy suggests that a co-word approach to natural language data collected from domain experts offers a more 'objective' way of modelling domains. He notes that "subjectivity in domain analysis can reduce the utility of the resulting domain model and can lead to misinformed system design and inadequate service to the domain" (1995 p3). However, subjectivity clearly remains if natural language texts are used; all any analysis can do is offer an accountable representation of the data. By 'objective', McGreevy probably means 'inductive'; that is, analysis that maximises the extent to which patterns endogenous to the data are included in the representation.

The QUORUM method offers a stepwise approach to collecting natural language data and converting it via a series of relational algorithms to network diagrams, matrices and indexes. McGreevy notes that it can be "used to derive object-oriented domain models from interview transcripts, incident reports, technical reports, informal domain descriptions and other domain documents" (1995 p11). This, then, is a further example of co-word analysis being successfully applied beyond formal texts.

Relations with ANT

What these three examples of co-word analysis share with ANT is a concern with induction as an ideal, and hence a need for a theoretical framework that is as empty as possible. This is the case in information retrieval, 'empirical' linguistics and 'objective' domain analysis. The strongly relativist and semiotic features of ANT address this need so that there is at least a *prima facie* case for arguing that the co-word networks developed from these different fields can be understood in terms of the actor-network.

Working within the actor-network approach tends to require the analyst to reject *a priori* distinctions. Indeed, one of its notable early successes was in persuading some analysts of the problems in maintaining an analytical distinction between the social and the technical. The actor-network approach is to be engaged with that which is being analysed and to seek distinctions from there. It is, in a word, inductive. (It is also several other things, such as reflexive and elusive.) Of course, no realisable analytic approach is wholly inductive, or wholly deductive, and methodological styles such as the experiment, ethnographic participant observation and interview-based qualitative work all configure the dialectic slightly differently. As we shall see, there are various points in a co-word analysis at which theory may be introduced.

The co-word methodology: general comments

The approach taken in the co-word studies was, in its form, experimental. It was to introduce defined, deduced, *a priori* categories into an inductive process of analysis, and to see what happened. The inductive analysis of the texts proceeded using a co-word methodology. The *a priori* categories were ‘machinic technology’, ‘the information chain’ and ‘formal scholarly communication’. These categories were developed from an expert assessment of the topic, informed by a close reading of relevant literature as discussed in Chapter One.

Network diagrams developed inductively using a co-word analysis formed the experimental field, made up of heterogeneous entities linked through persistent co-occurrence in a sample of texts. This was a process of controlled and accountable induction. Explicit categorical definitions of technology, the information chain and scholarly communication were then passed through this field as test signals, being transformed into more or less heterogeneous representations within the networks. This approach can be compared with others in terms of its position with regard to both accountability and epistemology.

In terms of accountability, the above split between induction and experiment can be construed as between analysis and interpretation. These two aspects of developing findings from qualitative data are normally conflated, rendering such development, perhaps, less accountable than the co-word methodology put forward here. Despite the existence of more or less rigorous inductive methodologies such as grounded theory (Glaser and Strauss 1967) or content analysis (Miles and Huberman 1994), findings can still seem to ‘emerge’ from qualitative data in a slightly mysterious and unaccountable way. As the co-word method is described below, it becomes clear that many choices implicit in other qualitative approaches are made explicit in this approach.

Epistemologically, the co-word approach can be contrasted with cognitive and even pragmatic approaches wherein authored texts (for example, utterances) derive meaning ideally from the contextualised intentions of their authors, such intentionality often being attributed to the existence of persisting mental states (Leech 1983). The co-word approach contrasts with these approaches because, certainly in its actor-network guise, it posits that the authorship of a text is an accomplishment of the text, and is not given beforehand. Intentionality, therefore, since it follows the establishment of authorship, cannot be a cause of meaning. Following Wittgenstein (1958), meaning is use, not intention. It is acknowledged that this is a controversial stance, but it is one shared by a number of contemporary research perspectives, notably ethnomethodology and conversation analysis (see Chapter Two).

The co-word methodology: data

The particular data used are described in detail in Chapter Four; this section is concerned with general comments about what constitutes data for co-word analysis.

There are two issues to be addressed in this section. The first concerns how a body of language use should be selected as appropriate for a particular analytic objective. The

second concerns how such a corpus should be rendered as data for a co-word analysis. I shall address these issues in turn.

McGreevy (1995) notes that the first step in the QUORUM method is to locate domain texts. These should be produced by domain experts, ideally for their own purposes rather than as a part of the analytic process. The analytic objectives for the two studies (described in Chapters Five and Seven) employing the co-word methodology were to investigate the relations between the academic information chain, formal scholarly communication and machinic technology in two related domains. Domain experts relevant to these objectives were clearly those engaged in (i) the information chain, and (ii) scholarly communication. That is, they were information professionals and academic researchers. Interviews were held with these two groups of domain experts as aspects of the UK FIDDO research project (Jacobs et al 2000). Details of these interviews are given in Chapter Four. At this point it is sufficient to note that the accounts given in these interviews were produced for purposes other than the analytic objectives of the studies presented here, while covering the relevant domains, so that the interview transcripts can be considered to comply with McGreevy's specification of appropriate domain texts.

The interviews were tape-recorded and transcribed verbatim, the transcripts being divided into speech turns, or a sequence of interviewer-interviewee turns. The interview data were taken to be all the speech of the interviewees during the interviews, but excluding the speech of the interviewer. The latter condition was imposed in order to focus the analysis on emic constructions rather than those explicated by the interviewer. Of course, it is not possible (or even desirable in many ways) in an interview situation to exclude the influence of the interviewer entirely. However, because the anticipated analysis focused closely on words within speech turns, it was thought legitimate to select only those words used by the relevant domain experts. At this point, then, the data consist of a large set of speech turns uttered by domain experts.

The second issue to be addressed is that of rendering this interview data in a form appropriate to co-word analysis. This itself is a two-step process. Firstly, the unit of analysis has to be specified and, secondly, the data have to be focused.

Co-word analysis operates by calculating indices to represent the degree to which words in a corpus are proximally related. Therefore, some unit of proximity is required.

Various approaches have been taken to this. Both Sinclair *et al* (1998) and McGreevy (1995) take a concordance-based approach to this issue, Sinclair *et al* suggesting that a concordance window of four words either side of the target is usual, while McGreevy recommends a window of half the average sentence length for the corpus in question.

While both these approaches have merit, they do impose tight restrictions on what counts as proximity. While Sinclair's linguistic focus might warrant this, the domain models generated by McGreevy would surely be limited by such a low proximity threshold. In the studies presented below, the speech turn was taken as the unit of proximity. Thus, if two words appeared in the same speech turn, this was counted as a relation between them. It was considered that over a sufficiently large corpus, this broader definition of proximity would yield richer domain representations than concordance-based approaches.

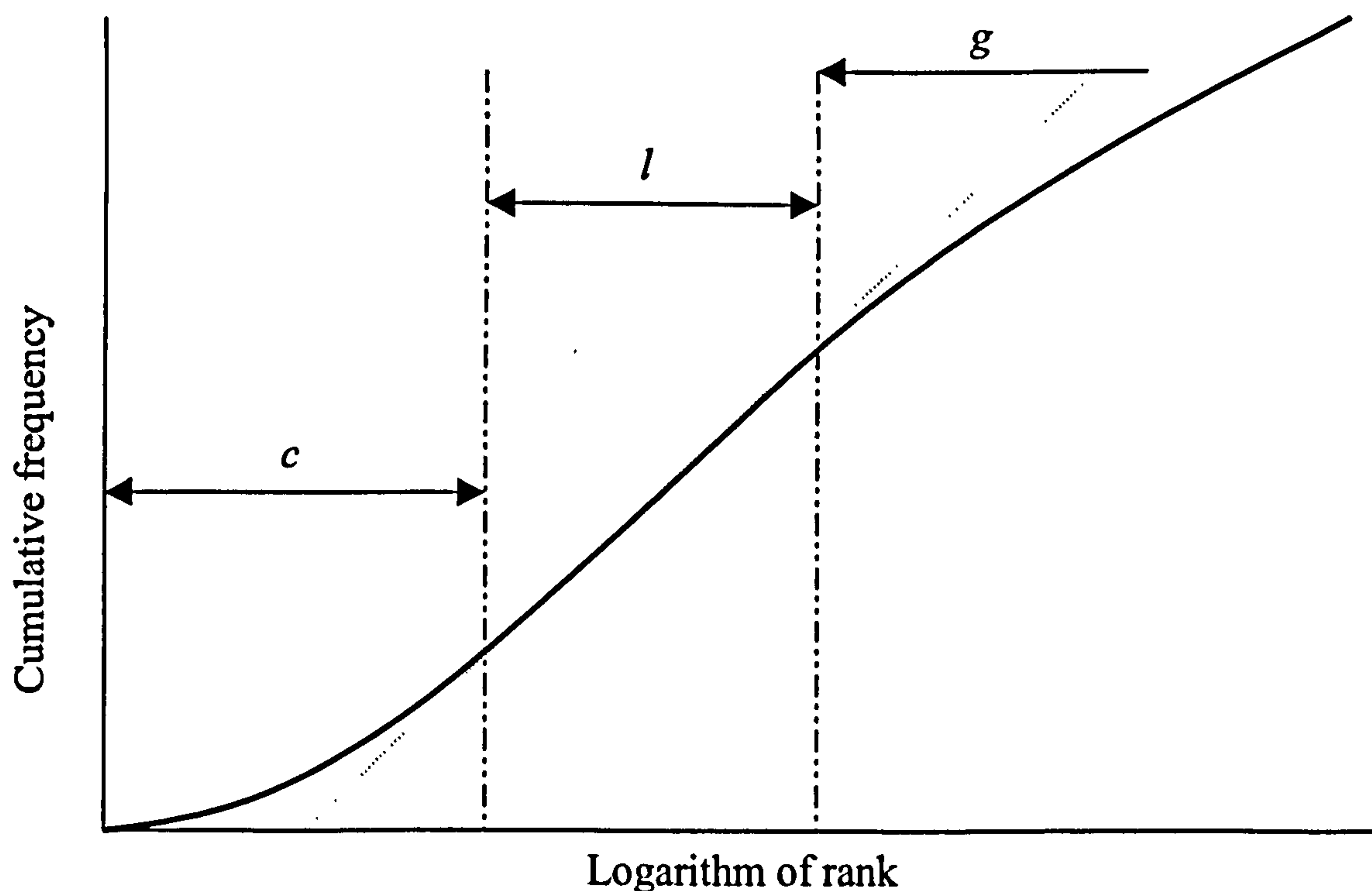
The next step was to focus the data. Apart from specifically linguistic analyses, such as Sinclair (1991), practitioners of co-word analysis reduce the richness of natural language to focus on the key, significant or forceful words in or of a text. The precise criteria by which this reduction is undertaken varies. Callon, Law and Rip (1986) were analysing the contents of scientific bibliographic databases, wherein texts were already described using keywords. These keywords were used by the analysts to stand for the full texts in the same way as Chen and Carr (1999) used citations. The selection of these keywords by the database producer was undertaken in order to facilitate the retrieval of relevant documents by scientists. From information retrieval theory (Willett 1988) we can infer that these keywords would have been selected to maximise the extent to which they differentiated between documents. For the purposes of generating a co-word representation of the texts, this is not ideal because it introduces a bias against words that are common to many texts in a domain. McGreevy (1995), on the other hand, was faced

with the full text of reports, and reduced these by conflating variants (plurals and so on) to single root words and by concentrating on nouns, verbs, adjectives and adverbs. A similar circumstance holds in the co-word studies reported below, so that McGreevy's method of conflation was broadly adopted. That is, a domain expert (the author) reviewed all the words used in the relevant interview corpora and selected, from those words used more than once, the nouns, verbs, adjectives and adverbs. This highly inclusive (and therefore long) list was then reduced by excluding those words that appeared in less than a certain proportion of the interviews in any analytically relevant sub-corpus. This ensured that the resulting list of 'prompt words' was not disproportionately influenced by the idiosyncrasies of a particularly verbose interviewee.

There appears to be a direct contradiction between the above approach to focusing the data and a principle of the actor-network semiotics upon which co-word analysis is founded. The contradiction is that, according to actor-network semiotics (Teil and Latour 1995), what a word means is derivable only from its context in the network. That is, the meaning of a word is its position in the network in relation to other words, and the network is derived from how words are used. Therefore, to exclude words from analysis on *a priori* grounds (such as grammatical function, as above) is invalid. However, Teil and Latour (1995) note that the co-word analysis they put forward is a way of negotiating the large expanses of conceptual space between micro-theories. A micro-theory is a set of rules within a closed system, and therefore is (or claims to be) valid only within a tightly defined domain. In the context of the actor-network, a micro-theory is a punctuated node. Experienced and reflexive practitioners in the relevant field should be able to use their judgement to select those words in a text that represent nodes that are reasonably punctuated. They are words that, if isolated, could prompt the practitioner reasonably to identify a relevant micro-theory. This is one way in which domain expertise (or theory) is allowed, explicitly and accountably, to contribute to the otherwise inductive generation of an experimental field of co-word networks. The second way in which theory contributes to analysis concerns the categorical definitions that are passed through the experimental field (see below).

A final configuration of the data relates to the idea that some means should be found of taking into account the fact that, in the list of prompt words for any corpus, some words are used much more frequently than others. It was thought that this should be represented in the networks in some way. The question then was what criterion to use to identify a core of prompt words in each corpus. Zipf notes (Garfield 1980) that the distribution of words in a natural language text, such as a novel, tends to be predictable. In fact, in some cases it tends to the same shaped distribution as that described as Bradford's Law (Brookes 1969) relating to scientometric phenomena. An example of this distribution is shown in Figure 2. It is commonly divided into three sections: the non-linear core, shown as *c* in Figure 2; the linear portion shown as *l*; and a second non-linear section to the extreme right-hand side, known as the Groos Droop and shown as *g*.

Figure 2: The 'Bradford' distribution



Key to Figure 2:

<i>c</i>	core
<i>l</i>	linear portion
<i>g</i>	Groos droop
.....	tangent to linear portion of graph
----	points where graph departs from tangent

A preliminary analysis of the prompt words in the interview data confirmed that, both as a whole and when divided into various sub-corpora, they were examples wherein Bradford distributions held. Because the distribution of prompt words was found empirically to correspond closely to a Bradford distribution, the non-linear section of the Bradford distribution was considered to be a reasonable definition of 'core'. The core for each corpus was estimated by graphical means and reported at the relevant points in Chapters Five and Seven.

The co-word methodology: categories

The analytic focus of the studies was on the information chain, scholarly communication and machinic technology. In order to operationalise these expressions, they needed categorical definitions. That is, they needed to be explicitly defined as categories of words rather than, for example, as cognitive or social entities. It is not claimed that this thesaurus approach to definition is any more accurate, explicit or robust than other approaches; merely that it is appropriate to the methodology being employed. Its limitations are clear. Words are used in context (principally in the context of other words), and the meaning of such complex expressions as 'formal scholarly communication' is not usually spelt out explicitly during such language use. Even if explicit definitions were available, they would be unlikely to be made by domain experts in the practice of their expertise, and so would not be appropriate data. Therefore, what is required is a set of words that can stand for the expression, whose use indicates that the meaning of the expression is relevant at that point in the piece of language use. The use

of a specified set of words to stand for a category in textual analysis has been used in linguistic studies, for example by Fortier, Keen and Fortier (1997). The idea of a 'lexical register', or set of words to indicate a domain-specific category, has been used by discourse analysts, for example Fowler (1991). However, because language is a play of differences, any word could, in principle, be an indication that an expression such as 'scholarly communication' was relevant. Categorical, thesaurus-like definitions can therefore only ever have an indeterminate and probabilistic relation to the expression for which they stand. Accepting this limitation, how might reasonable and relevant categorical definitions be found for the 'information chain', 'formal scholarly communication' and 'machinic technology'? In order that they should be relevant, the sets of words should be chosen from among the words used in the domain in question. In order that the definitions be reasonable, the words should be chosen by reference to experience of practice in that domain. The three expressions are discussed as topics in Chapter One. The author used expertise from this discussion, plus practical knowledge of the field, to select from the total list of prompt words in each study a set of 20 words that could stand for each of these three categories. They were derived from the definitional statements in Chapter One, and were:

Academic information chain words

These were selected to focus on actors and processes that are constituents of a model of the information chain that was widely recognised as such at the time of the fieldwork.

This list was:

Academics, BLDS, Commercial, Company, Consortium, Contract, Copyright, Customer, Database, Delivery, ILL, Intermediary, Librarian, Library, Publisher, Researcher, Subscription, Supplier, Supply, User.

Formal scholarly communication words

These were selected to focus on media and forms that are a part of a model of formal scholarly communication that was widely recognised as such at the time of the fieldwork.

The list was:

Abstract, Article, Book, Citation, Collection, Diagram, Document, Journal, Literature, Newspaper, Page, Periodical, Publish, Read, Reference, Referenced, Scan, Table, Text, Write.

Machinic technology words

These were selected to focus on machine-like artefacts, or processes that necessarily involved using such artefacts. The list was:

Acrobat, CD(ROM), Computer, Disc, Download, Electr(on)ic, Email, Internet, Mac, Machine, Memory, Network, Online, PC, Photocopier, Printer, Screen, System, Technical, Web.

These categories formed what were described above as ‘test signals’, to be passed through the experimental fields of the co-word networks in order that their image in those fields could reveal something about the expertise and theories that went into compiling these lists. It is clear that these categorical definitions are challengeable, both at the level of the general approach and at the level of the individual words chosen. Paradoxically, the availability of the second challenge constitutes an accountability that is built into the approach, strengthening it against the first challenge. Domain expertise, or theory, is again allowed to contribute to the analysis in an explicit and accountable way.

The co-word methodology: generating the networks

The co-word methodology was used as an inductive means to represent the interview corpora. The *a priori* word categories and the frequency word category ‘core’ (discussed above) were superimposed on these representations.

Two metrics have been used in the literature to operationalise the co-word methodology, each of which relies for inputs on the raw frequencies of each of two words and their co-occurrence frequency.

Strength of association, S:

The strength (S) of association between two words was used as the first and principal structuring of the interview corpora. The use of co-word analysis on interview transcripts (rather than on descriptors or texts of scholarly literature) has been undertaken by Monarch and Gluch (1995) and by Coulter, Monarch, Konda and Carr (1996) at Carnegie Mellon University. In common with studies of scholarly literature (Callon, Courtial, Turner and Bauin 1983, Palmer 1999), these have employed the S metric in the analysis. The S metric is also advocated by Teil and Latour (1995), although it is there called the coefficient E.

Suppose two words, WordA and WordB, appear at various points in a corpus. If the corpus is divided into N units (for example, documents or speech turns in interviews), then n_a is the number of units in which there is an occurrence of WordA, and n_b is the number of units in which there is an occurrence of WordB. Let n_{ab} be the number of units in which both WordA and WordB are found. An expression for the strength S of the association between the two words is:

$$S(n_a, n_b, n_{ab}) = (n_{ab}^2) / n_a \cdot n_b \quad (0 \leq S \leq 1)$$

This is a symmetrical expression for WordA and WordB, so that:

$$S(n_a, n_b, n_{ab}) = S(n_b, n_a, n_{ba})$$

The metric S can be used to produce global co-word association diagrams that include all associations above a certain threshold. However, these can be difficult to read effectively, especially if sub-networks of words need to be analysed. An alternative is to produce *leximappes*. These are produced by successive passes through a set of co-word association data, to produce highly configurable representations of sub-networks of words whose existence may not be apparent from a global network diagram. The production of *leximappes* is described in more detail below.

Inclusion index, I:

Co-word analysis developed out of the qualitative scientometrics of Callon, Law and Rip (1986). The theoretical basis of their work was actor-network theory. An important concept in this approach is that of 'translation', wherein certain networks can, for certain purposes, be 'black-boxed' so that they can be 'spoken for' by a discrete entity. In analysing the keywords associated with a corpus of scientific articles, Callon, Law and Rip (1986) note that these keywords can be shown to form a hierarchical structure according to the extent to which they 'include' other keywords. That is to say, if every occurrence of Word A is accompanied by Word B (but not vice versa), then Word B effectively includes Word A as a subset. The metric developed to index this property of co-word matrices was:

$$I(n_a, n_b, n_{ab}) = n_{ab} / \min(n_a, n_b) \quad (0 \leq I \leq 1)$$

That is, the value of the index equals the raw co-occurrence frequency divided by the lower of the two frequencies for the individual words. This metric is asymmetrical for Word A and Word B, so that generally:

$$I(n_a, n_b, n_{ab}) \neq I(n_b, n_a, n_{ba})$$

Interestingly, Sinclair (1991), approaching co-occurrence from a linguistic perspective, notes that there are what he calls 'upward' and 'downward' collocations of words, which correspond to the concept of inclusion as described here.

The degree of inclusion between words measured by I could, like the co-word association S, be represented on global network diagrams that showed all inclusions above a certain threshold. It should be noted that the inclusion index identifies the most directed relationships in a co-word matrix. That is to say, it does not reflect word frequencies, or even absolute co-word frequencies. Instead, it is solely concerned with the extent to

which one word includes another. Therefore, the inclusion network diagrams do not necessarily show the same words as the strength of association network diagrams.

Leximappes

Whereas global network diagrams were useful in identifying the general shape of the network representing a corpus, and particular clusters of words, a means was required to focus on how these clusters related to each other. This was the strength of the leximappe procedure.

'Leximappe' is the name of a computer programme (unfortunately unavailable to this project) that has been developed by researchers in this field to identify and display subnetworks within a global co-word matrix. The principles on which the program works have been publicised (Coulter, Monarch, Konda and Carr 1996) and were used in this project as the basis for producing a series of leximappes for each corpus under analysis. However, certain enhancements were made to the leximappe procedure. The first of these was that this project based the construction of leximappes (as with the global network diagrams) on the S index, rather than on raw co-occurrence frequencies. This meant that account was taken of the bias in raw co-occurrence data against medium-frequency, highly associated words.

The leximappe procedure as deployed in this project started by identifying the two words in a corpus linked by the highest value of S. These were used as the seed pair for the first leximappe. The next highest value of S linking to one of these seed words was then found, and this third word introduced into the growing subnetwork. Again, the next highest value of S linking to one of the words already in the subnetwork was found. This time, of course, this could be an internal link not bringing a fourth word into the subnetwork. The process of growing the leximappe continued until a cut-off point was reached. This project used a cut-off of 10 nodes (words) per leximappe at this stage, following Monarch and Gluch (1995). This was a somewhat arbitrary cut-off, chosen to

generate leximappes of a reasonable size. The links described so far have been what was known as 'internal links'. The minimum S for internal links for each leximappe was the lowest value of S for any internal link.

The second leximappe was started using a seed pair of words not included in the first subnetwork that were linked by the highest remaining value of S. This second leximappe was built using the same principles as the first, excluding all nodes (words) already used.

Subnetworks were thus grown until a cut-off point. For the purposes of this project, a cut-off was set at seven leximappes per corpus, or the limit of the data, whichever was the smaller. Again, this was perhaps arbitrary, but it was expected and found to be the case that seven leximappes covered a good proportion of the apparently meaningful patterns in the data.

What has been described so far comprised the first pass through the data. A second pass was necessary to complete the leximappe procedure. The aim of this second pass was to show the immediate context of each leximappe in terms of the words from other leximappes that were significantly related to it. It will be noted that a result of the first pass through the data was a list of (often 70) words included in the leximappes for a particular corpus. This list was the universe of words limiting the second pass through the data.

For each subnetwork, a cut-off value of S was specified so that the resulting diagram remained legible. All the remaining links above this threshold to words within the relevant universe were noted on the subnetwork diagram. These were external nodes.

So far the procedure as described followed that of the Leximappe program. However, there were three important supplements added for the purposes of this project. Firstly, it will be apparent that, if the minimum S for external links was less than that for internal links then there may be some internal links with S between these two values. These were noted as such in the leximappes. Secondly, indications of the *a priori* categories and of

the 'core' words in each corpus were added to the leximappes. The third supplement to the Leximappe procedure was to combine or synthesise the leximappe series for each corpus to focus on the *a priori* categories. The aim was to produce a synthesis diagram showing, for each corpus, all of the *a priori* category words as they appeared in the leximappes. From these representations it would be possible to locate the categories with respect to each other and to specify the degree to which they were discrete, were split or were amorphous with respect to the network of which they formed a part. The production of a synthesis diagram was achieved by the following sequential rules:

1. Include in the synthesis all words in the corpus universe that appear in the relevant categories;
2. Add to the synthesis all words linked to these words in a subnetwork by internal links;
3. Add external links between category words to link the synthesis into a single network (if possible);
4. Add links to non-category words so as to link the synthesis into a single network with the fewest possible links.

In this way it was possible to construct representations of the *a priori* categories as they were represented in each corpus. These synthesis diagrams can be considered to be spatial representations of the definitions of these categories in use in the interview text corpus.

The co-word methodology: operationalising the methodology and presenting the networks

Following from the discussion above, the co-word analyses presented in Chapters Five and Seven were structured into three levels. The first of these was concerned to gain an overview of the co-word network representing the particular corpus in question and to identify clusters of words that could reasonably be considered to be semantic units. That is, although this study took individual words as the unit of analysis, it was possible to think of empirically identified clusters of words as semantic units, or as literally

'meaningful' collections of words within the domain relevant to the data. These clusters were identified in the first instance by reference to global network diagrams. These were constructed from the association and inclusion matrices as described above and were drawn using Krackplot V3.0 software (Krackhardt, Blythe and McGrath 1994). The layout of the diagrams was designed to maximise legibility, so that the length of lines was not significant; if two nodes (words) were connected by a line of any length then that implied a relation between those words above the threshold level for that diagram. Nevertheless, the legibility criterion meant that longer lines were avoided where possible, so that the clustering of nodes could be assumed to suggest a semantic unit and the layout of the diagrams was not arbitrary¹⁰. Global network diagrams aimed to show all co-word associations or inclusions above a certain threshold. Given the limitations of the network drawing software available and of any two-dimensional representation of multi-dimensional data, limits had to be imposed on the number of links it was possible to display on global association and inclusion diagrams. These limits enabled diagrams to be presented that were legible. Different thresholds were required for different corpora and for association (S) and inclusion (I) diagrams. Only words linked to other words at index values above the relevant threshold were shown on each diagram. Because the inclusion index is asymmetric, the resulting diagrams were directional. This was represented by using arrows from the 'included' word to the 'includer' word. That is to say, if every occurrence of Word A was accompanied by Word B (but not vice versa), then Word B effectively included Word A as a subset, and the arrow pointed from WordA to WordB.

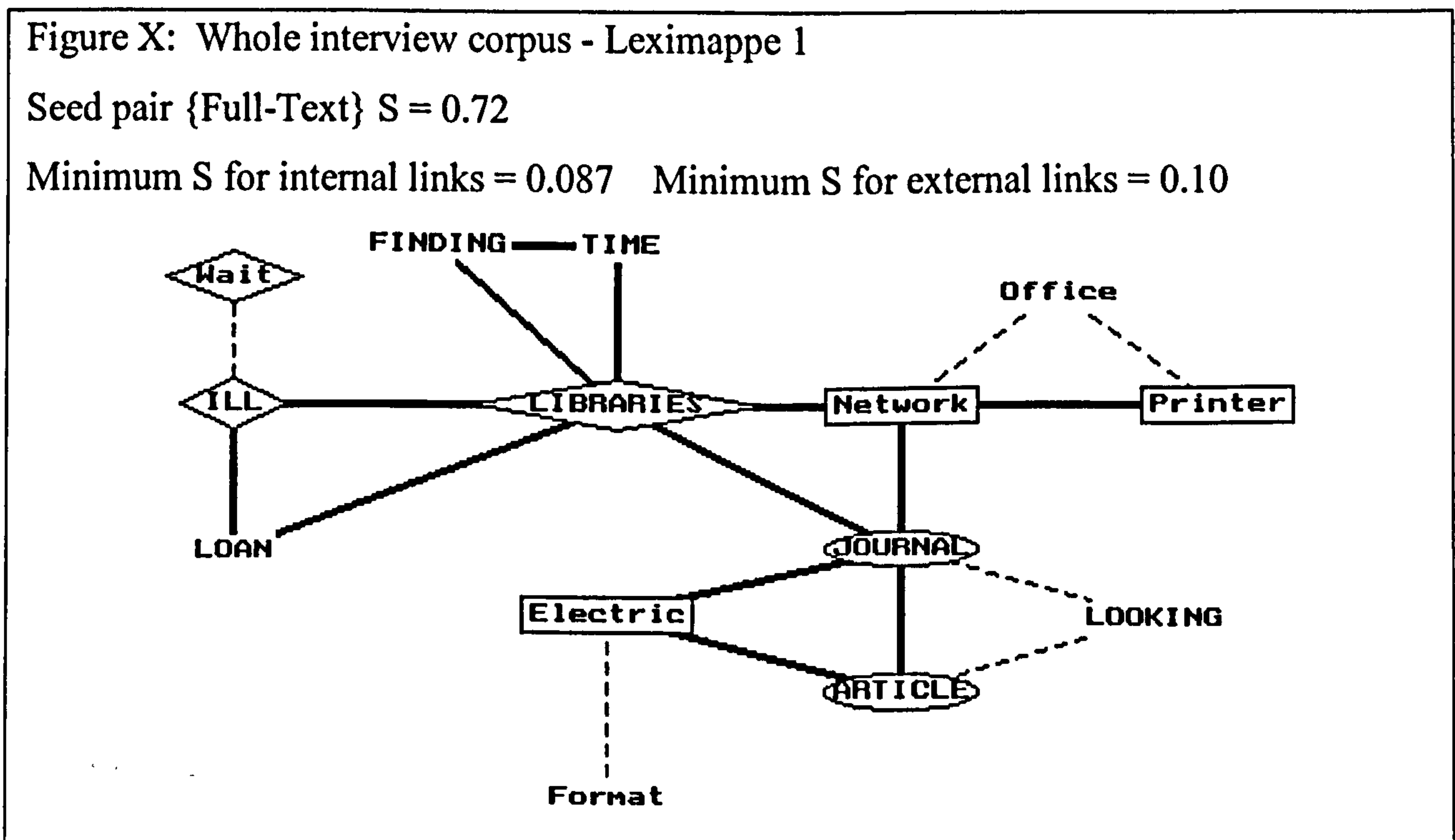
The second level of analysis was concerned to specify for each corpus how the clusters identified in the global diagrams were related to each other. To do this, the leximappe procedure was used. The results of the procedure were a series of leximappes for each corpus, which specified in detail the links between words and word clusters. The leximappes were also drawn using Krackplot V3.0 software.

10. Krackplot enables graph layout by either multidimensional scaling or simulated annealing algorithms, but these features were not used as they proved inadequate for the purposes of presenting legible and comparable graphs.

In the third level of analyses, the aim was to focus attention on the categories of words identified as being of interest, scholarly communication, the information chain and technology. A synthesis diagram was generated from the leximappe series representing each corpus, using the procedure described above. From this synthesis diagram, it was possible to infer the degree to which the categories represented discrete and / or important clusters in the data, how they were composed and what their relationship was to each other.

A sample leximappe diagram is shown here to act as a key for those presented in Chapters Five and Seven. The simpler global association and inclusion diagrams are also based on this key.

Figure 3: Sample leximappe





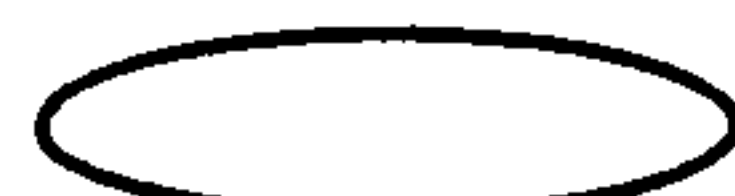

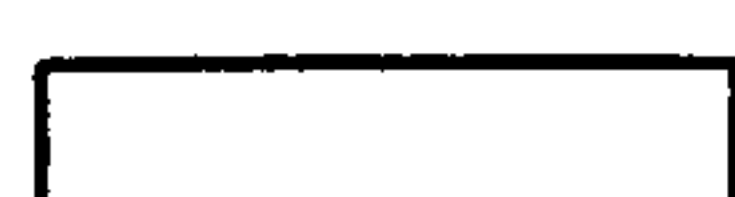
Key to Figure 3:

“Figure X: Whole interview corpus - Leximappe 1”

Specifies leximappe

“Seed pair {ILL-Loan} S = 0.72”	Value of S for the first internal link in the leximappe
“Minimum S for internal links = 0.087”	Value of S for the last internal link to be added to the leximappe
“Minimum S for external links = 0.10”	External links above this value are included in the leximappe

UPPER CASE	Core words (from Bradford-like frequency distribution)
lower case	Non-core words (from Bradford-like frequency distribution)

	Internal links (leximappes only)
	External links (leximappes only)
	Formal scholarly communication category word
	Academic information chain category word
	Machinic technology category word

Summary and conclusions

Actor-network semiotics, as operationalised in co-word analysis, offers a rigorously semiotic and inductive technique for the representation of textual data. This is a technique that borrows from many disciplines, including sociology, linguistics and

information science, but which synthesises aspects of each into a coherent methodology. It is possible to imagine the result of applying the technique to a textual corpus as being a multidimensional experimental field in which words from the corpus form a web according to the extent to which they are proximally related. Categorical definitions, for example of machinic technology, can be passed through this field, and the resulting distribution analysed as reflecting precisely how those definitions work (operate as discrete entities, cluster, link to other definitions) in the textual corpus in question.

The limitations of the approach are those of the actor-network. They are, firstly, the poverty of the theoretical concepts available to analysts. Proximity would appear to be a very limited concept by which to relate words, although (as will become apparent in the empirical studies themselves) surprisingly rich findings can be derived using it alone. Secondly, and relatedly, the semiotic roots of ANT might seem to restrict the kind of questions possible.

Chapter Four: Data

Introduction

The purpose of this chapter is to describe the data to be used in this study to link the theoretical ideas put forward in Chapter One and the methodological approaches discussed in Chapters Two and Three. Chapters Five to Eight then offer a set of four analyses based on these links. Anonymised versions of the data used in this study and described in this chapter are archived with other information from the FIDDO Project at Loughborough University Department of Information Science.

Chapter One introduced a division between a set of topics, a set of theoretical perspectives and a set of methodological resources. The topics were scholarly communication, the information chain and technology. The theoretical perspectives were classical sociology, social constructionism and actor-network theory. The methodological resources were the techniques of discourse analysis (discussed in Chapter Two) and co-word analysis (discussed in Chapter Three). All four of the analytic chapters to follow are concerned with the topical range described in Chapter One. Two of these four chapters demonstrate the use of discourse analysis, associated with social constructionism, and two demonstrate the use of co-word analysis, associated with actor-network theory.

I suggested in Chapter One that important sites for analysis were the ways in which the boundaries between the three topics were articulated and managed. Although not necessarily implying that such boundary articulation and management is undertaken by those engaged in practices relevant to the topics, fieldwork involving such people would clearly be most relevant. The analytic chapters that follow are therefore based on fieldwork with academic researchers, librarians, publishers, document suppliers and so on.

The data available for the analyses were transcripts from two sets of interviews undertaken as a part of the FIDDO Project (Jacobs et al 2000). FIDDO stands for 'Focused Investigation of Document Delivery Options'. The project was a part of the Electronic Libraries Programme of research and ran from 1995 to 1999. The interviews were conducted by the author in 1998-9. Interviews with academic researchers and librarians took place in five universities in the UK East Midlands, and those with publishers and other information chain professionals took place either in the interviewee's place of work or over the telephone. Although the interview schedules (see Appendix A) were constructed with the particular needs of the FIDDO Project in mind, the resulting interviews were diverse and rich enough to allow supplementary analysis. That is to say, the interviews were:

- concerned with the topics outlined in Chapter One - scholarly communication, the information chain and technology;
- undertaken with people engaged in practices relevant to these topics;
- structured enough to be comparable within each set, and to ensure that the topics were covered;
- open-ended enough to allow interviewees to give full accounts of their answers to interview questions, and for these accounts to form the bulk of the transcripts.

Because of their origin in the FIDDO Project, the interviews were divided into two sets, one covering academic researchers, the other covering academic librarians, publishers, document suppliers and so on. For this reason, and because these two groups could be argued to be in structurally distinct relationships with the topics, the analyses maintained the divide between them. Hence, Chapters Five and Six relate to the interviews with academic researchers, whereas Chapters Seven and Eight relate to the interviews with information professionals. The four analytic chapters therefore form a two-by-two matrix:

Figure 4: The structure of the analysis

Interviews with / Analysis by	Co-word analysis	Discourse analysis
Academic researchers	Chapter Five	Chapter Six
Information professionals	Chapter Seven	Chapter Eight

Different subsets of the data were used for each of these chapters, and these are described and justified below, along with the specific operational methods used to (re)present the data.

Data for Chapter Five - Co-word analysis of interviews with academic researchers

Transcripts were available of 158 interviews with academic researchers working in the departments of business, geography and manufacturing engineering across five UK universities. The interviewees ranged from Ph.D. students, through research associates and fellows, to academic faculty. There were 69 interviews with researchers in business schools, 24 interviews with researchers in departments of geography and 65 interviews with researchers in departments of manufacturing engineering. Although no ‘pure’ sciences, social sciences or humanities were chosen, this set of interviewees was thought to offer a range of research practices, both within each subject area (which were chosen because of their interdisciplinary features) and between subject areas.

The 158 interviews can be divided in the first instance into two groups. Those in the first group were conducted as a benchmarking exercise prior to field-testing a variety of electronic document access systems. These interviews, then, related to the (then) current practices of researchers. Those in the second group were conducted as an evaluation of the electronic document access systems. The interview schedules were kept as consistent

as possible across the two groups in order to aid comparison between them (see Appendix A). Table 2 gives details of the size of the interview corpus.

Table 2: The interview corpus for academic researchers

Corpus	No. interviews	No. speech turns	No. prompt words	No. words in core
Whole	158	4975	89	22
Benchmarking interviews	95	3312	103	18
Evaluation interviews	63	1663	73	24
Benchmarking: business	36	1380	129	22
Benchmarking: geography	17	585	105	20
Benchmarking: m. engineering	42	1347	87	18
Evaluation: business	33	1106	91	16
Evaluation: geography	7	98	41	13
Evaluation: m. engineering	23	459	68	22

‘Speech turns’, ‘prompt words’ and ‘core’ are all defined in Chapter Three. The principles by which the data were rendered appropriately for co-word analyses are also described in Chapter Three. In practical terms, all of the words included in the corpus were listed in frequency order using Microsoft Excel. This list was examined, and any word with a frequency greater than one that could be interpreted by a domain expert (the author) reasonably unambiguously was selected. This resulted in a list of 809 words. A single manual consolidation pass was then undertaken through this list, reducing noun and adjective forms to a single variant, and similarly with verb and adverb forms. This resulted in a final list of 543 words. They are listed in Appendix B. For each corpus described in Table 2, only those words from this list that appeared in at least 25% of the interviews were included as prompt words. This figure was set so that the number of prompt words in each corpus was under 150, since that was the limit imposed by the available software. Core words were identified from a Bradford-like frequency distribution of this set of prompt words, as described in Chapter Three.

A few words should be added about two matters concerning the process whereby word variants were consolidated. Firstly, certain variants (for example, the words 'copy' and 'copies') were kept distinct on the grounds that a close reading of the interviews by the author suggested that one was not necessarily just the plural of the other. This was a matter of judgement that perhaps reflects an unavoidable imprecision in the idea of a 'word'; that is, are 'copy' and 'copies' variants of the same word or are they different but related words? It would perhaps be possible to resolve the matter by focusing a co-word analysis on occasions of their use but, because this was not the objective of this analysis, the matter was left to the judgement of the author. Secondly, certain idiomatic phrases (such as 'key word') were inconsistently transcribed in the interviews. Unfortunately, this was not discovered until the analysis was complete, so that it has resulted in certain minor incongruities in the results.

Data for Chapter Six - Discourse analysis of interviews with academic researchers

The data available for the discourse analysis were the set of 158 interviews with academic researchers described above. Although collected specifically for content analysis as a part of FIDDO, they were thought to be rich enough to allow supplementary analysis. In particular, interactions between the interviewer and interviewee offered ample opportunities for the deployment of the kinds of mechanisms identified by conversation analysts and discursive psychologists (see Chapter Two). It should be noted that the researchers did not have access to the interview schedule during the interviews.

As noted above, the interviews can be divided into two groups; those that were conducted as a benchmarking exercise prior to field-testing a variety of electronic document access systems, and those that were conducted as an evaluation of the electronic document access systems. Although the details of the interview structure as a whole (see Appendix A) are not relevant to Chapter Six, attention is drawn to Question 13 of the benchmarking interview and Question 14 of the evaluation interview:

B.13. If you could have instant access to any document, would it make a difference to the quantity or quality of your research?

E.14. Do you think having access to SYSTEM has / would have an effect on the quantity or quality of your research?

The first thing to note is that these questions bear directly on formal scholarly communication (and, as will be shown in the analyses, were heard as doing so by participants). The second thing to note is that the form of the latter was designed to refer or relate to the form of the former, so that the answers given could be compared and conclusions drawn. However, in discourse analytic terms the two questions are also similar. They were designed to set up a dilemma of stake or interest for the interviewees, the dilemma being as follows. On the one hand, it was assumed that many researchers would like the idea of improved access to documents and would therefore need, given the interview circumstances, to offer an account of this preference. On the other hand, to the extent that researchers used the accounts offered (relating to the quality or quantity of their research), then they risked being seen to implicitly criticise their current research on the grounds that its quality or quantity were not what they should be. This interest dilemma was the focus of one set of analyses, and is discussed further in Chapter Six.

Since analysis of the whole of 158 interviews in terms of their discourse analytic features was impossible, the data was limited to the interactions around the two questions specified here, B.13 and E.14. Indeed, further selection was needed to keep the study to manageable proportions, which raises the question of representativeness. That is, to what extent do the excerpts chosen for analysis represent the corpus as a whole? Some of the sting in this question is removed when it is recalled that data are not treated in discourse analysis as a sample or a synecdoche. The excerpts are not called on to stand for the rest of the data in the same way as in other forms of analysis because, from the ethnomethodological perspective, they are themselves accountable interactions. That is, the analysis is based on the case study model, rather than the statistical model.

The interviews were taped and transcribed, though not according to conversation analytic conventions (Psathas and Anderson 1990). The transcriptions were created to focus attention on a level of interactional detail that lies between that of conversation analysis and broad content-driven approaches such as grounded theory. As many interactional details, such as non-lexical interjections, as possible were retained in the transcriptions so that a conversation analytic perspective was not precluded. However, intonation and some other markers were excluded, since their inclusion can render transcripts difficult to read so that the interaction that they represent becomes difficult to imagine. Line-breaks indicate pauses.

It may be argued that interview data is not appropriate for analysis using discourse or conversation analytic methods. Generally, CA emphasises the use of ‘naturally occurring’ interactive talk. However, as Edwards (1997 p89) points out, “while this seems to rule out studies that use experimental procedures or interviews, it does not strictly do so. Any interactional phenomena can be naturalised by treating it as natural. So if what you have are interview data, then that is how to treat them, as a species of talk-in-interaction, as ‘interview’, rather than as treating the questioner as researcher, the question schedule as ‘method’, and only the responses as ‘data’”. This is the approach taken in Chapters Six and Eight.

Data for Chapter Seven - Co-word analysis of interviews with information professionals

The data consisted of 33 interviews with information professionals. These included academic librarians, managers at the British Library Document Supply Centre (BLDSC), and people working in commercial organisations such as publishers, database aggregators and commercial document access or delivery companies. The interviewees were either managers in these organisations or other key personnel such as technical officers. In the context of the FIDDO Project, the interviews were designed to elicit views concerning

the future of document access in higher education, and the sorts of technical and organisational systems that might be envisaged. The interview schedule (Appendix A) was structured around four hypothetical scenarios and five questions, making each interview a matrix of twenty topics. In terms of the co-word network field to be generated from the transcripts of these interviews, it is possible to imagine this matrix as a structure that may be consistent throughout the field and may be identifiable by reference to the interview schedule. Table 3 gives details of the size of the interview corpus.

Table 3: The interview corpus for information professionals

Corpus	No. interviews	No. speech turns	No. prompt words	No. words in core
Whole	33	1542	94	36
Librarians	19	743	94	33
BLDSC	5	303	124	40
Commercial	9	496	121	33

Again, ‘speech turns’, ‘prompt words’ and ‘core’ are all defined in Chapter Three, as are the principles by which the data were rendered appropriately for co-word analyses. The same procedure was followed as for the data for Chapter Five, resulting in an initial list of 2700 words, reduced to 1172 prompt words after a single manual consolidation pass. These are listed in Appendix C. Again, to keep the number of prompt words to under 150 for each corpus (the limit of the software), only those words from this list that appeared in at least 65% of the interviews in that corpus were included as prompt words. Once again, core words were identified from a Bradford-like frequency distribution of this set of prompt words, as described in Chapter Three.

There were only five interviews with managers from the BLDSC, which would appear on the face of it to be a small sample. However, if the population is taken to be the

management team at BLDSC, then five interviews represents relatively good coverage of that team.

Data for Chapter Eight - Discourse analysis of interviews with information professionals

The data available for the analyses were the set of 33 interviews with professionals working in organisations conventionally thought to be central to the information chain, as described above. Despite being clearly unbalanced in favour of academic libraries, there was sufficient breadth of coverage to support the proposed analyses. Although the interview schedule, like those used with academic researchers, was constructed with the particular needs of the FIDDO Project in mind, the resulting interviews were diverse and rich enough to allow supplementary analysis. Again, interactions between the interviewer and interviewee offered ample opportunities for the deployment of the kinds of mechanisms identified by conversation analysts and discursive psychologists.

The interview schedule shown in Appendix A consists of a set of four hypothetical scenarios in which academic researchers obtain documents, and a series of questions that relate to each scenario. The schedule was printed on cue cards and was available to both interviewer and interviewee throughout the interviews. In some cases this meant that the schedule could be considered as a third voice in the interview, asking questions and delimiting answers. In other cases the schedule was the topic. Such characterisations were empirical questions.

The interviews were transcribed similarly to those with academic researchers, and analogous issues of selection, representativeness and appropriateness applied.

Summary

This chapter has detailed the data used in the following four analytic chapters. Although all the data were generated during the FIDDO Project, this study takes several different cuts into those data, depending on analytic focus and methodology. Nevertheless, in considering the substantive findings (see Chapter Nine), it is important to remember the constraints implicit in taking the interviews described above as ‘data’.

Chapter Five: Co-word analysis of interviews with researchers

Introduction

The objective of this chapter is to investigate how academic researchers talk about scholarly communication, the information chain and technology. The principles and procedures of the co-word methodology and presentation have been described in Chapter Three, and the relevant data has been described in Chapter Four. This chapter is concerned with presenting the analysis of interviews with academic researchers. Note that Chapter Three also included a key to the diagrams presented in this chapter.

As described in Chapter Four, the interviews with researchers are divided along two dimensions, according to whether they were benchmarking or evaluation interviews, and according to the subject area of the researchers. In addition, an analysis was undertaken of the interview corpus as a whole, to act as a general benchmark and introduction to the form of the analysis. This results in a matrix structure to the analyses and to the sections in this chapter as shown in Table 4.

Table 4: The structure of Chapter Five

	Benchmarking interviews	Evaluation interviews
Whole corpus {	2	3
Business	4	5
Geography	6	7
Manufacturing engineering	8	9

Numbers in Table 4 refer to section numbers in this chapter.

1. Whole interview corpus (researchers)

This section is concerned with the whole researcher interview corpus, which amounted to 158 interviews. In later sections this corpus is broken down by subject area and by whether the interview was a benchmarking or an evaluation interview. Because it conflates two different types of interview (benchmarking and evaluation), the analysis of the whole researcher interview corpus is not very informative in and of itself.

Methodologically it provides the model for the remaining analyses, and substantively it provides a baseline against which the results of the various other analyses can be compared. The results are given in the following order:

- Graphical estimation of the core words used most frequently;
- Global network showing the overall distribution of the words in the interviews according to the S (association) and the I (inclusion) indexes;
- Leximappes for the whole corpus;
- Synthesis of leximappes to show ‘scholarly communication’, ‘information chain’ and ‘technology’ networks in relation to each other.

Graphical estimation of the core

As noted in Chapter Three, a core of words for each corpus was estimated graphically from the Bradford-like distribution of the prompt words for each corpus. The non-linear section of the graph for the whole researcher interview corpus included all words ranking above Log 3.1, which gave a core of words as follows:

**LIBRARIES, TIME, JOURNAL, PAPER, FINDING, LOOKING, ARTICLE,
RESEARCH, PROBLEM, WORK, SEARCH, SYSTEM, READ, SEARCHES, ILL,
ACCESS, ABSTRACT, DOCUMENT, INFORMATION, LOAN, PRINT,
REFERENCE.**

In the network diagrams and leximappes that follow, these words are capitalised (see Chapter Three for a key to the diagrams).

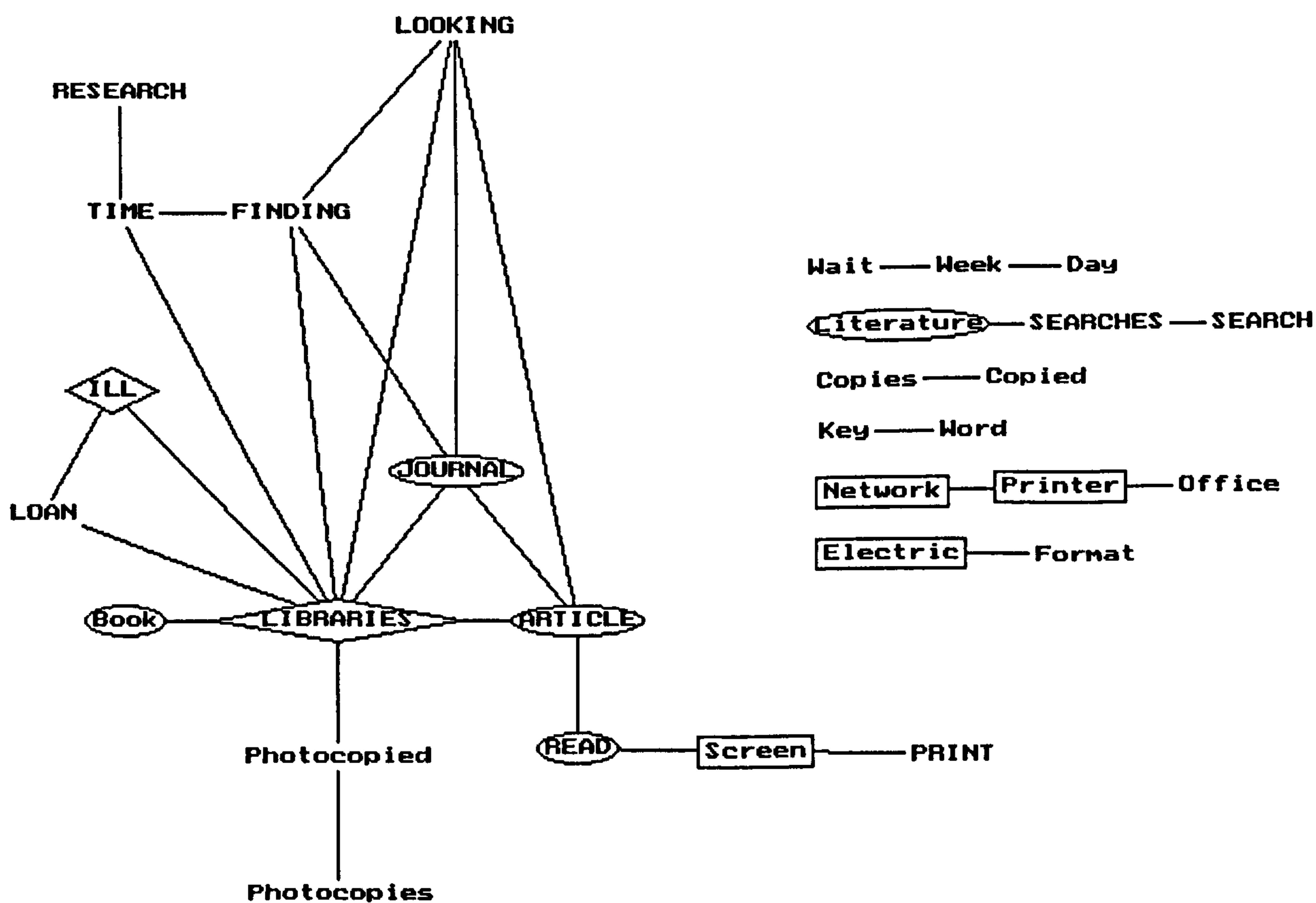
Global network diagrams

The global association network diagram for the whole researcher interview corpus, including both benchmarking and evaluation interviews across all three subject areas, is shown at two threshold values of the association index in Figures 5 and 6.

Figure 5: The global association network diagram from the whole researcher corpus

(1)

(threshold $S = 0.05$)

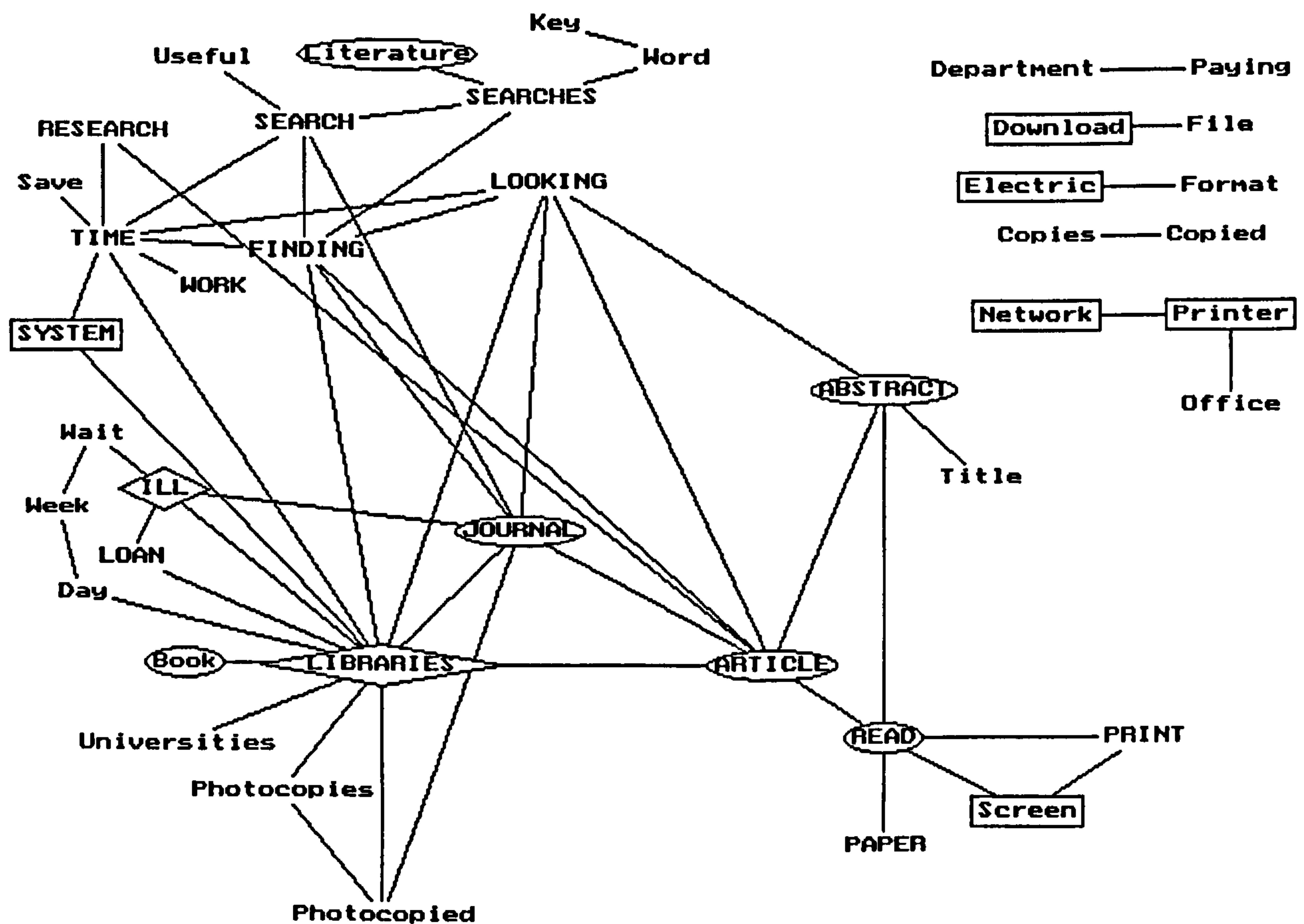


At this high threshold value of the association index we can make out the central position of 'Libraries', which seems to be associated with a number of clusters, including:

- {ILL-Loan}
- {Journal-Finding-Looking}
- {Article-Read-Screen-Print}
- {Photocopied-Photocopies}

In addition, there are several clusters not connected to 'Libraries' at this threshold level, including {Wait-Week-Day} and {Network-Printer-Office}. Finally, there are some dyads that seem to be so closely related semantically as to be idiomatic in this domain, for example 'Key-Word'. Scholarly communication words are central to the diagram, whereas only one technology word ('Screen') is related to the main network. Technology words are more common in the small clusters not connected to the main network at this threshold value. The information chain is represented only by {ILL-Libraries}. If we increase the detail by decreasing the threshold value, we get Figure 6. I have tried in Figure 6 to maintain the layout of Figure 5 so that it is clear how Figure 6 has grown from Figure 5.

Figure 6: The global association network diagram from the whole researcher corpus (2)
 (threshold $S = 0.04$)



The first thing to note is that at this threshold level of the association index, $S=0.04$, the majority of the diagram has become somewhat confusing. The central position of 'Libraries' is still discernible, and several links have been added to that main network. In addition, two of the three dissociated clusters have been linked into the main network; {Wait-Week-Day} around 'ILL' and 'Libraries', and {Literature-Searches-Search} around 'Finding' and 'Journal'. Scholarly communication words remain central to the main network, with technology words for the most part limited to dissociated clusters and dyads such as {Electric-Format}. The only place where the two categories are directly related are at {Read-Screen} toward the bottom-right of the main network. The information chain remains represented only by {ILL-Libraries}

The composition of the semantic clusters is made clearer by considering the other dimension being used to relate words, which was inclusion. A corresponding global inclusion diagram is shown in Figure 7.

Figure 7: The global inclusion network diagram from the whole researcher corpus (threshold I = 0.4)

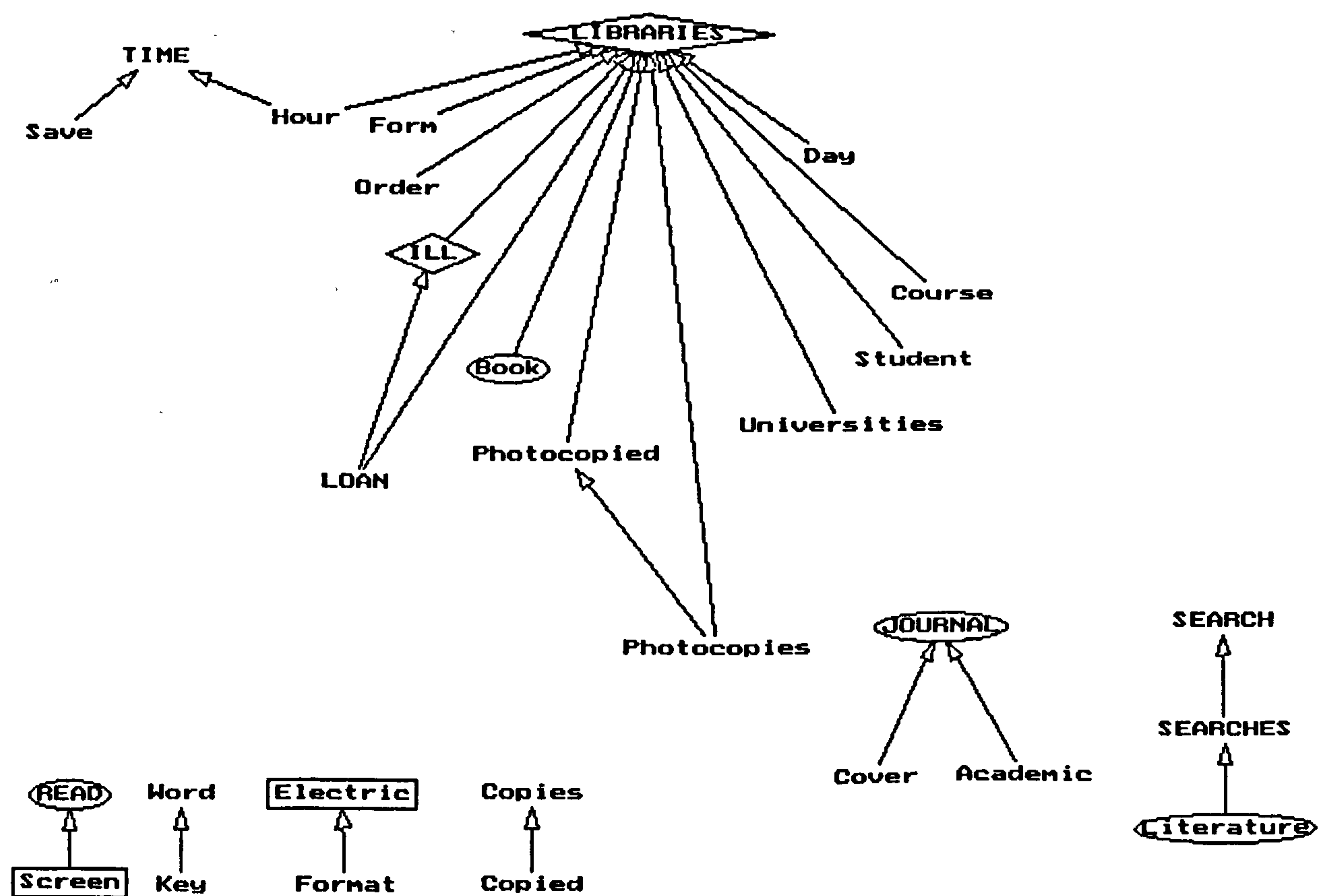


Figure 7 confirms the central position of 'Libraries' in the actor-network in the corpus, with a large number of words tending only to appear in combination with it. In addition, we can see the hierarchical nature of the clusters {Literature-Searches-Search}, {ILL-Loan-Libraries} and {Photocopies-Photocopied-Libraries}. Furthermore, both 'Time' and 'Journal' can be seen as words with which less frequently used words tended to be found. The wide variety of words included by 'Libraries' is striking. Among them are:

- 'Universities', 'Student' and 'Course';
- 'Day', 'Hour';
- 'ILL', 'Loan' 'Form' and 'Order'.

Such a breakdown clearly imposes categories on the data, but the point being made is to emphasise the variety of less frequently used words that 'Libraries' tends to include. Thinking in terms of the actor-network, 'Libraries' is clearly a centre of translation within the discourse of researchers, its heterogeneous actor-network linking elements conventionally categorised as organisational, temporal and service-oriented. Technology words are, however, not in the 'Libraries' actor-network at the resolution of the global diagram. Of the scholarly communication words, only 'Book' is linked into the 'Libraries' actor-network. Figure 7 also shows the many of the dyadic pairs from the association diagrams to be highly hierarchical.

It is difficult to infer much more from the global network diagrams for the whole corpus. Certainly, the second level of analysis, how clusters linked to each other, was difficult from only the global network diagrams. However, a finer-grained analysis was possible using the leximappe procedure, and the results of this are discussed below.

Leximappes

A series of leximappes was produced for each corpus, as described in Chapter Three, and these offered a way of focusing attention on how semantic clusters were related to each other. The series for the whole corpus is shown here. The figures at the head of each diagram give technical information relating to the production of the leximappe; again, for details the reader is referred to Chapter Three.

Figure 8: Whole researcher corpus - Leximappe A

Seed pair {Copies-Copied} S = 0.72

Minimum S for internal links = 0.036 Minimum S for external links = 0.040

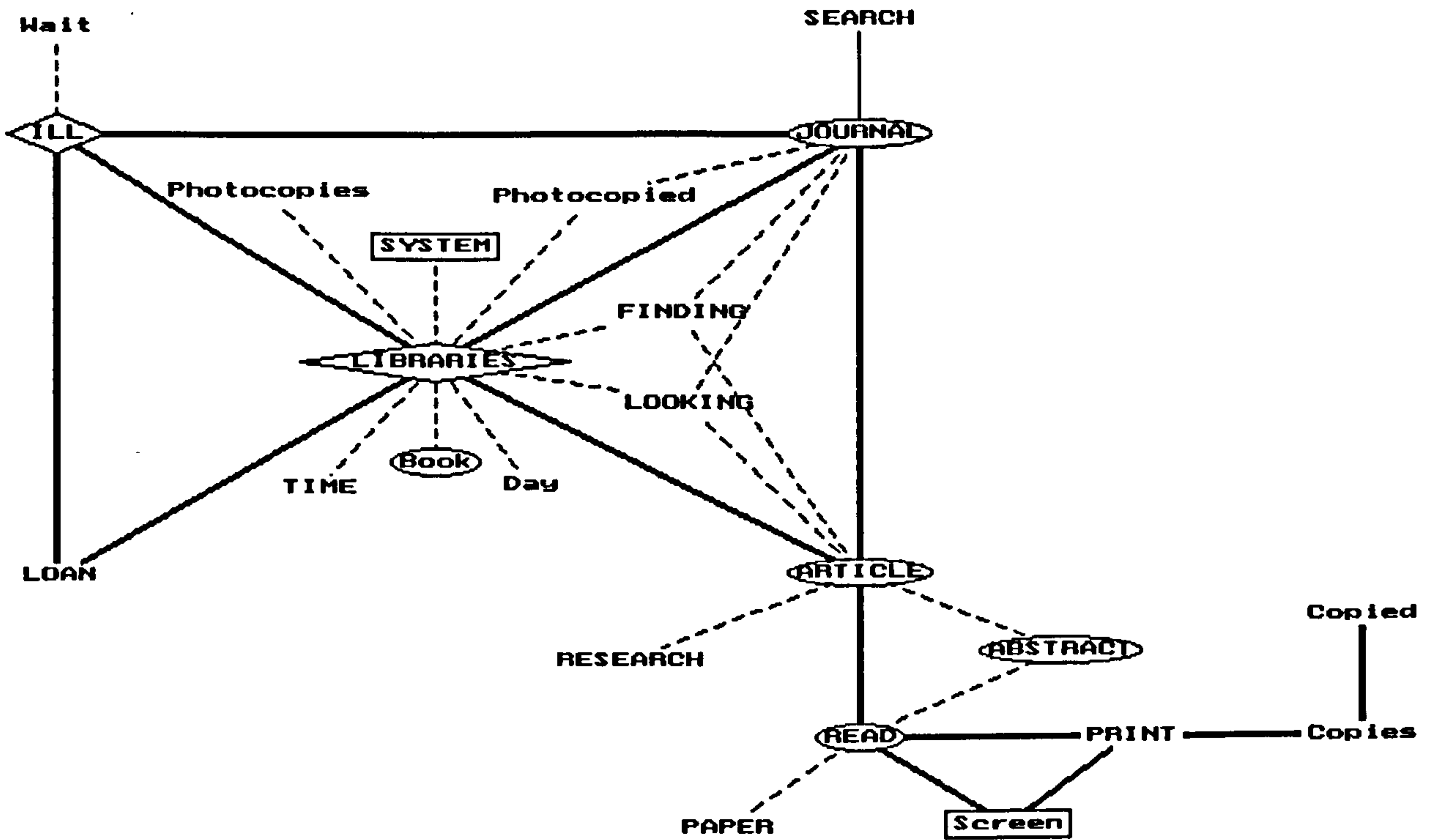


Figure 9: Whole researcher corpus - Leximappe B

Seed pair {Search-Searches} S = 0.63

Minimum S for internal links = 0.043 Minimum S for external links = 0.040

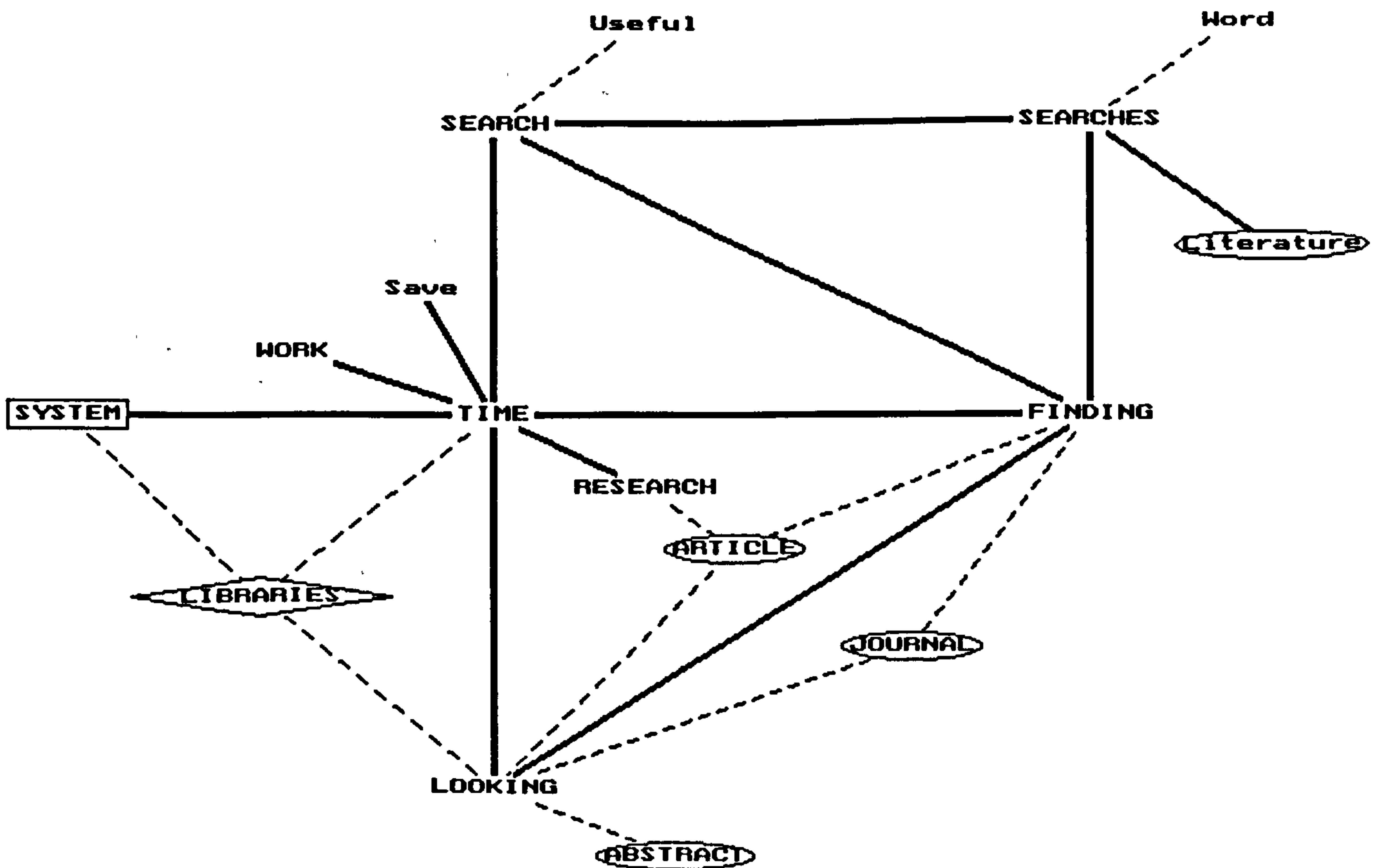


Figure 10: Whole researcher corpus - Leximappe C

Seed pair {Photocopies-Photocopied} S = 0.57

Minimum S for internal links = 0.019 Minimum S for external links = 0.020

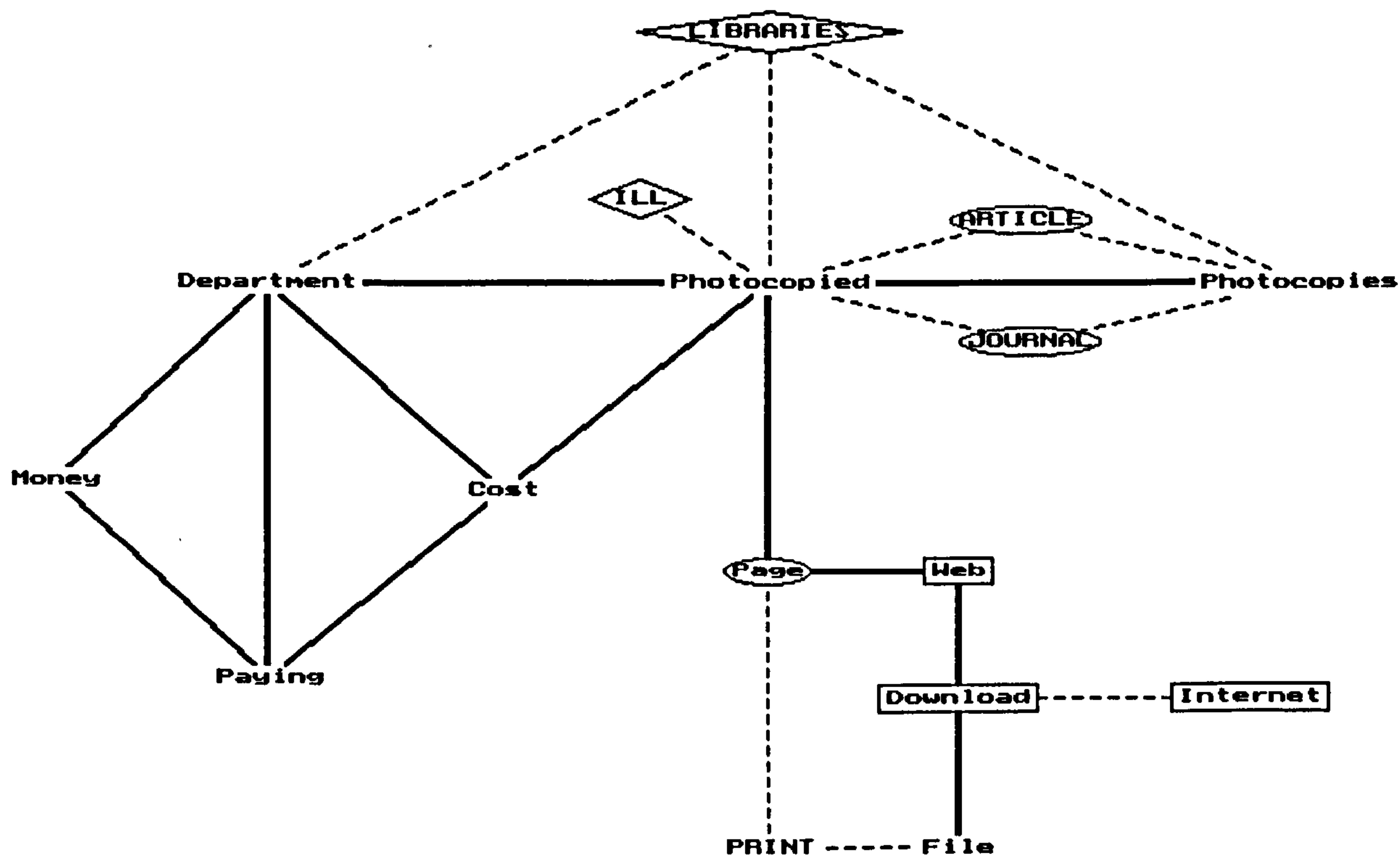


Figure 11: Whole researcher corpus - Leximappe D

Seed pair {Key-Word} S = 0.19

Minimum S for internal links = 0.0079 Minimum S for external links = 0.030

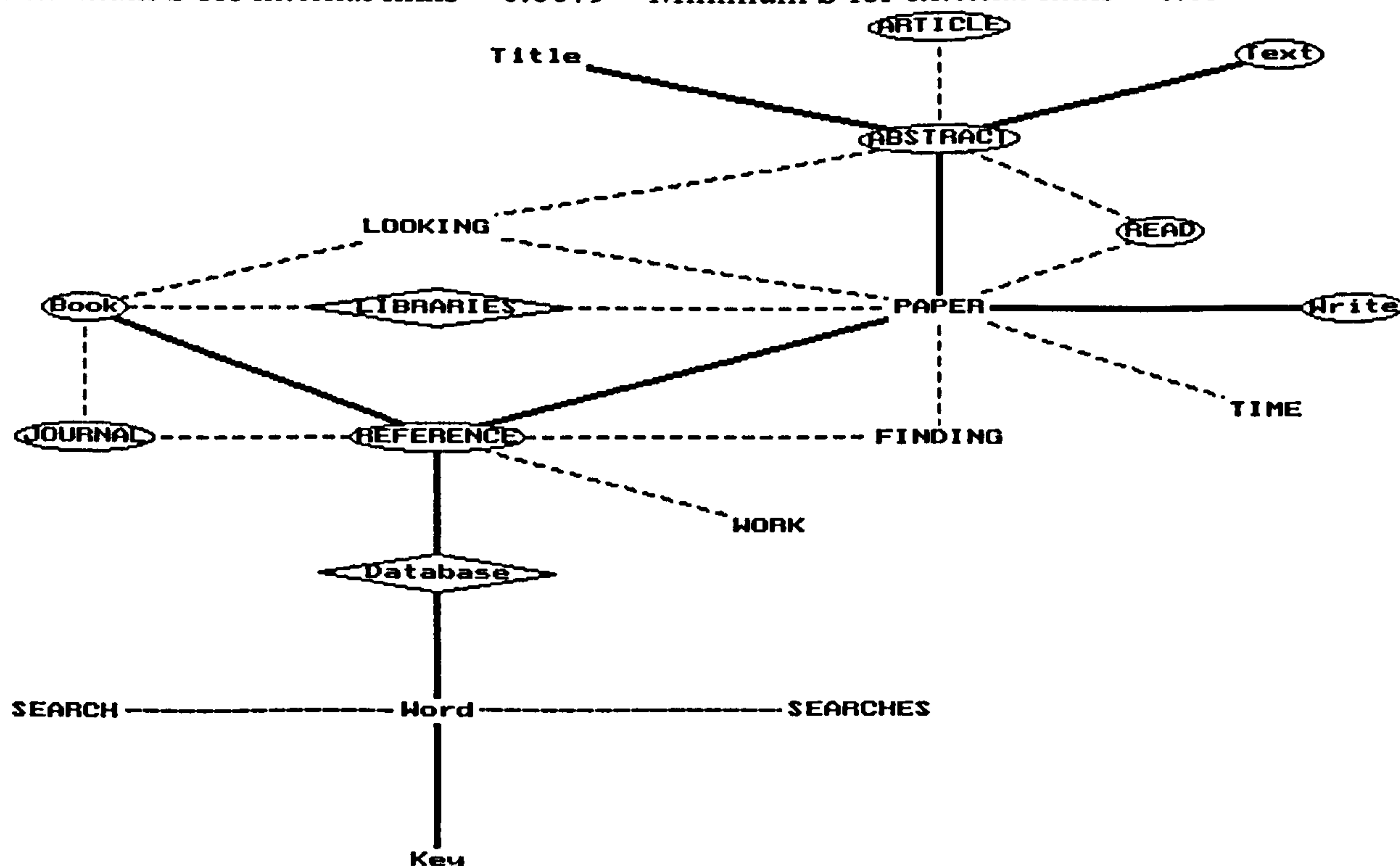


Figure 12: Whole researcher corpus - Leximappe E

Seed pair {Electric-Format} S = 0.11

Minimum S for internal links = 0.018 Minimum S for external links = 0.020

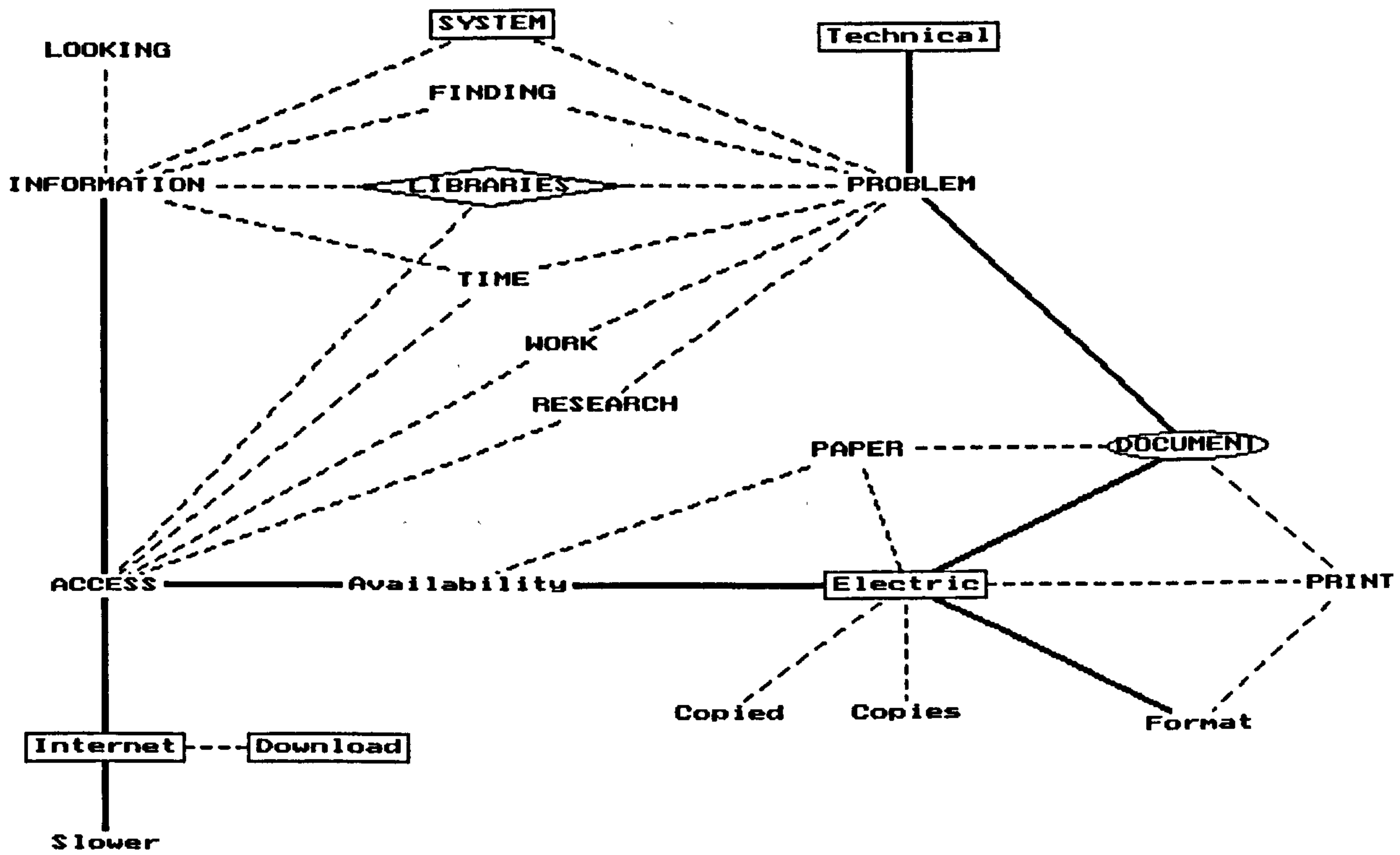


Figure 13: Whole researcher corpus - Leximappe F

Seed pair {Network-Printer} S = 0.091

Minimum S for internal links = 0.013 Minimum S for external links = 0.020

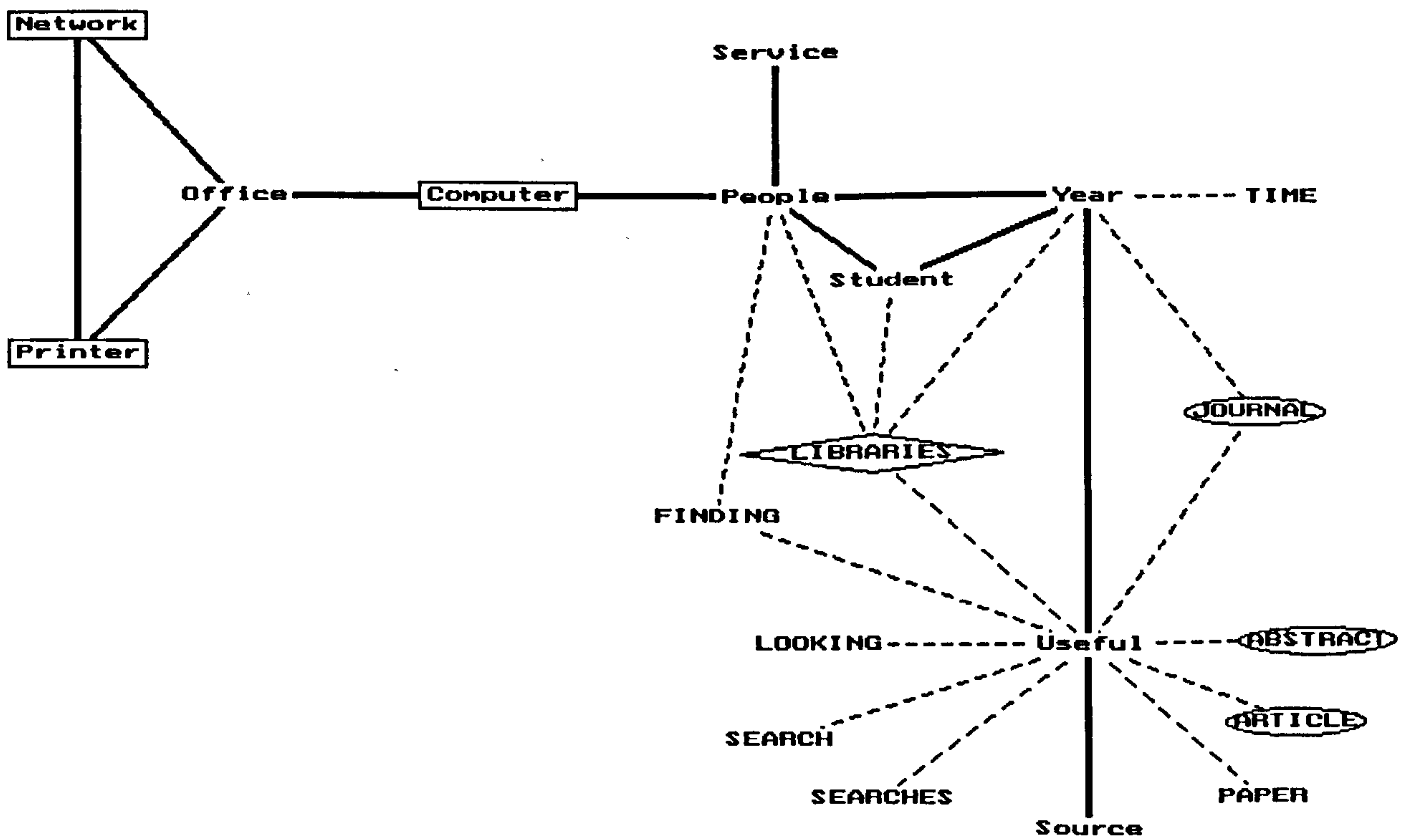
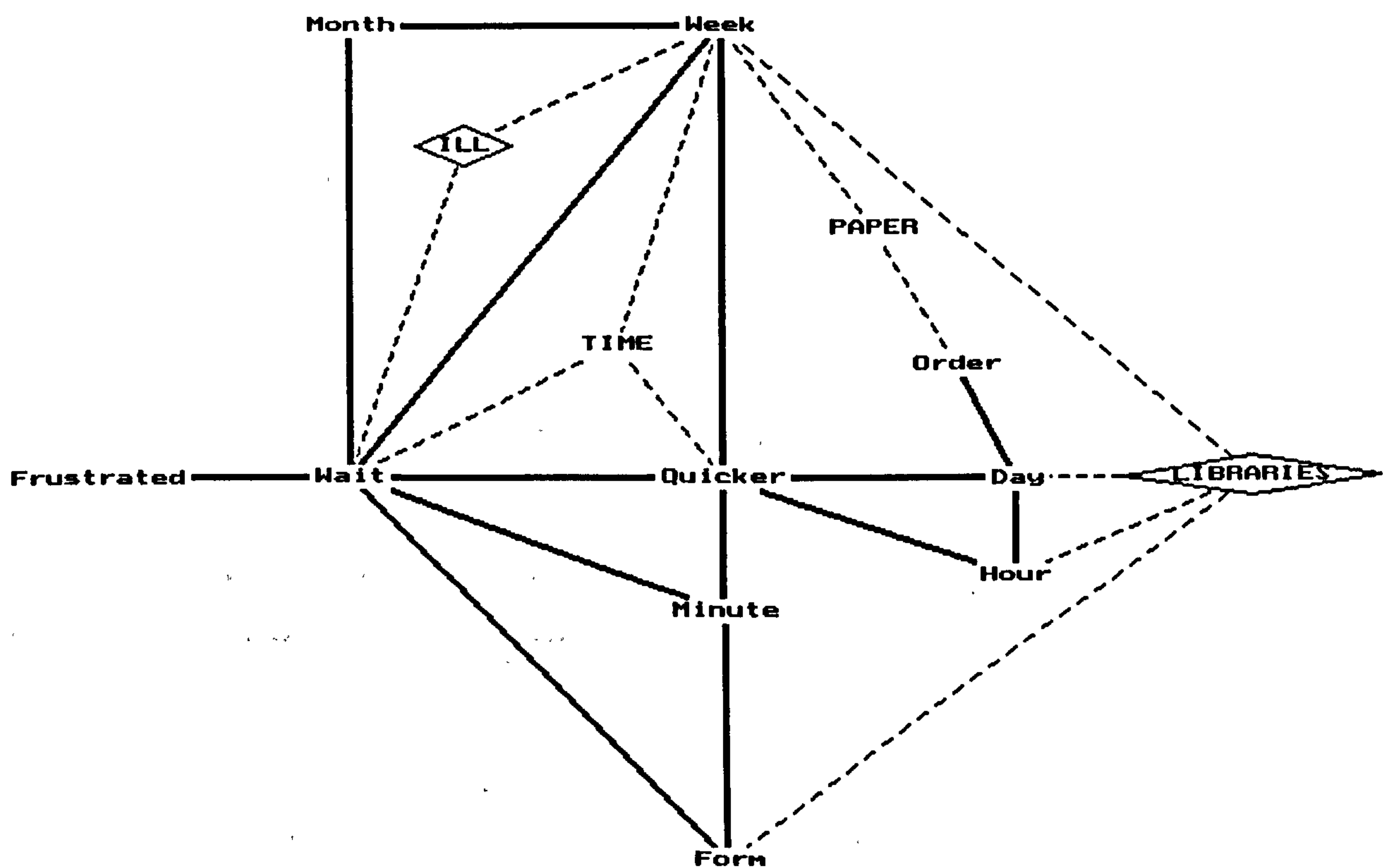


Figure 14: Whole researcher corpus - Leximappe G

Seed pair {Wait-Week} S = 0.076

Minimum S for internal links = 0.0095 Minimum S for external links = 0.025



It will be seen that these diagrams are highly structured and related to the global network diagrams shown in Figures 5 and 6. Leximappe A (Figure 8) is centred on 'Libraries', reflecting the central position of that word in the global network diagrams. In addition, three of the clusters from that diagram are included in Leximappe A, {ILL-Loan}, {Journal-Article-Read} and {Read-Screen-Print}. We can say, then, that 'Libraries' plus these clusters form a semantic core in the whole researcher interview corpus. This core includes a number of scholarly communication words, the information chain dyad {ILL-Libraries}, but only one technology word; 'Screen'. Leximappe B (Figure 9) isolates a region to the top-left of the global association diagram (Figure 6), centred on 'Time'. Leximappe C starts with the cluster immediately below 'Libraries' in Figure 6 {Photocopies-Photocopied} and links that with two of the dissociated clusters, {Department-Paying} and {Download-File}. Leximappe D contains a large number of scholarly communication words and is centred on 'Abstract' and 'Reference'. Of these, only 'Abstract' appears in the global network in Figure 6. Leximappes E and F contain

the bulk of the technology words and each of them starts from one of the dissociated clusters in Figure 6. Leximappe G expands the {ILL-Loan} cluster from Leximappe A.

Synthesis

Regarding the analytic focus, technology, scholarly communication and the information chain, it is perhaps not easy to get an overall sense of the structure of the words making up these categories or how the categories relate to each other. Therefore, a synthesis diagram was constructed (as described in Chapter Three) to include all the scholarly communication, technology and information chain words. This is shown as Figure 15.

Figure 15: Whole researcher corpus - Synthesis diagram

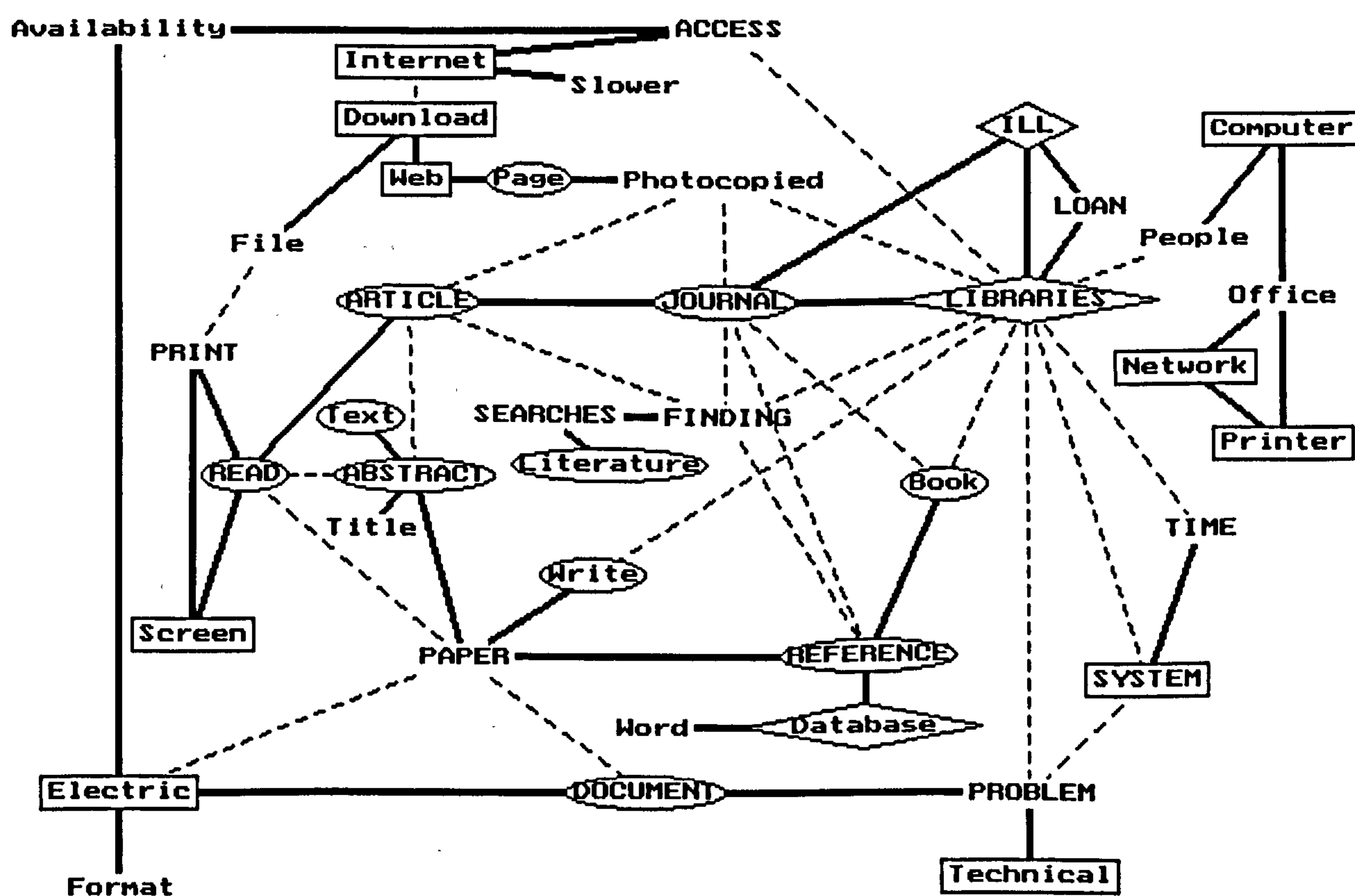


Figure 15 shows that the categories of scholarly communication and technology are largely separate, and that of the information chain is marginal. Scholarly communication words are mainly in the centre of the network, whereas technology words are mainly at the periphery. This is not an accident of layout but has occurred because of the inter-linking within and between the two sets of category words.

The information chain is represented in the interviews with researchers by {ILL-Libraries} and, separately, 'Database', which could easily have been defined as technology rather than the information chain. The link between the information chain {ILL-Libraries} and scholarly communication is via 'Journal' and 'Book' and to the fragmented category of technology via {System-Technical-Problem}, {People-Computer} and {Access-Internet}. We can conclude that researchers in the interviews expressed a fairly narrow view of the information chain, consisting of a multi-functional library service. This was certainly related to the interview schedules, which, although wide-ranging, were focused on campus-based activities. Nevertheless, the absence of any significant mention of publishers, copyright, commercial arrangements and so on is revealing. The centrality of 'Journal' perhaps reflects its dual identity as a product and as a scholarly forum.

Scholarly communication seems to be a fairly discrete category, the only non-category word holding a central position being 'Paper', which could easily have been included in the category definition. The one small separate branch concerns {Literature-Searches}. Technology, on the other hand, seems to be a much less discrete category and is perhaps best described in terms of three main sub-categories. Firstly, there is the region to the right, {Network-Printer-Office-Computer}, which is only weakly held into the network at all. Secondly, there is the cluster {Electric-Technical-System} at the bottom of the Figure 15. Finally, there is a region to the top-right of the diagram {Download-Web-Screen}, which seems as closely associated with scholarly communication words as with other technology words. This boundary region is especially interesting. It appears to be concerned with transforming networked access into readable documents via the processes of photocopying, downloading and printing. This, then is the semantic region wherein researchers across the whole researcher interview corpus linked machinic technology and formal scholarly communication.

Of course, to some extent this boundary region is a result of the agenda set by the interview schedules. This would be the case in all empirical work. However, the

interview schedules were broad, covering current and hypothetical situations and circumstances, so that the results do have a measure of generalisability. The two interview schedules, benchmarking and evaluation, offered researchers different opportunities to talk about scholarly communication, the information chain and technology, and it is to separate analyses of these two sets of interviews that we now turn.

2. Benchmarking interviews

This section is concerned with the benchmarking interview corpus, which amounted to 95 interviews. As above, the results are given in the following order:

- Graphical estimation of the core words used most frequently;
- Global network showing the overall distribution of the words in the interviews according to the S (association) and the I (inclusion) indexes;
- Leximappes for the benchmarking corpus;
- Synthesis of leximappes to show ‘scholarly communication’, ‘information chain’ and ‘technology’ networks in relation to each other.

Graphical estimation of the core

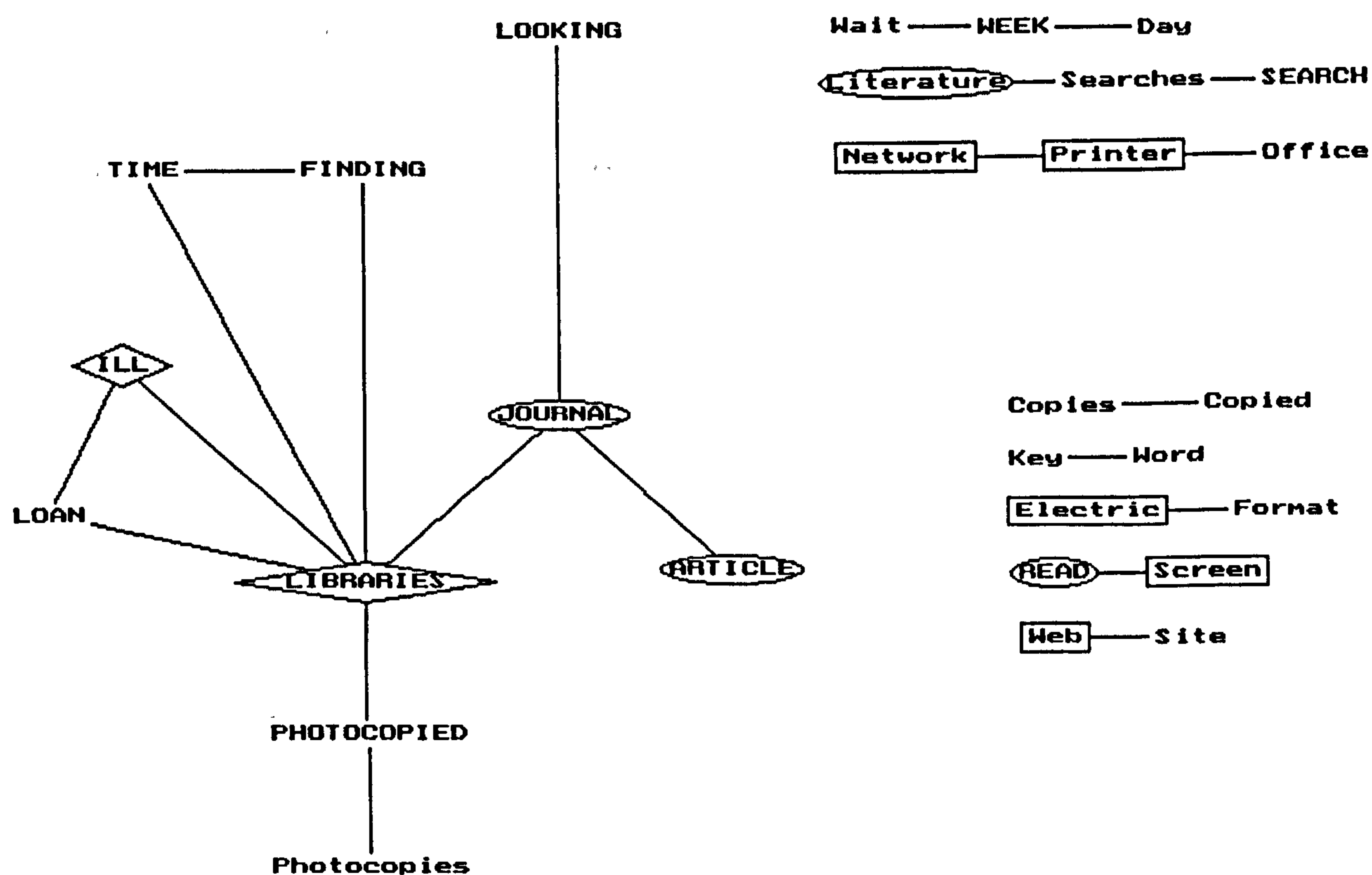
The core of words for the benchmarking corpus was estimated graphically from the Bradford-like distribution of the prompt words. The non-linear section of the graph included all words ranking above Log 2.9, which gave a core of words as follows:

LIBRARIES, TIME, JOURNAL, PAPER, RESEARCH, FINDING, LOOKING, ARTICLE, ILL, WORK, READ, SYSTEM, PROBLEM, LOAN, ACCESS, PHOTOCOPIED, SEARCH, WEEK.

Global network diagrams

The global association network diagram for the benchmarking interview corpus across all three subject areas, is shown at two threshold values of the association index in Figures 16 and 17.

Figure 16: The global association network diagram from the benchmarking interview corpus (1)
(threshold $S = 0.07$)



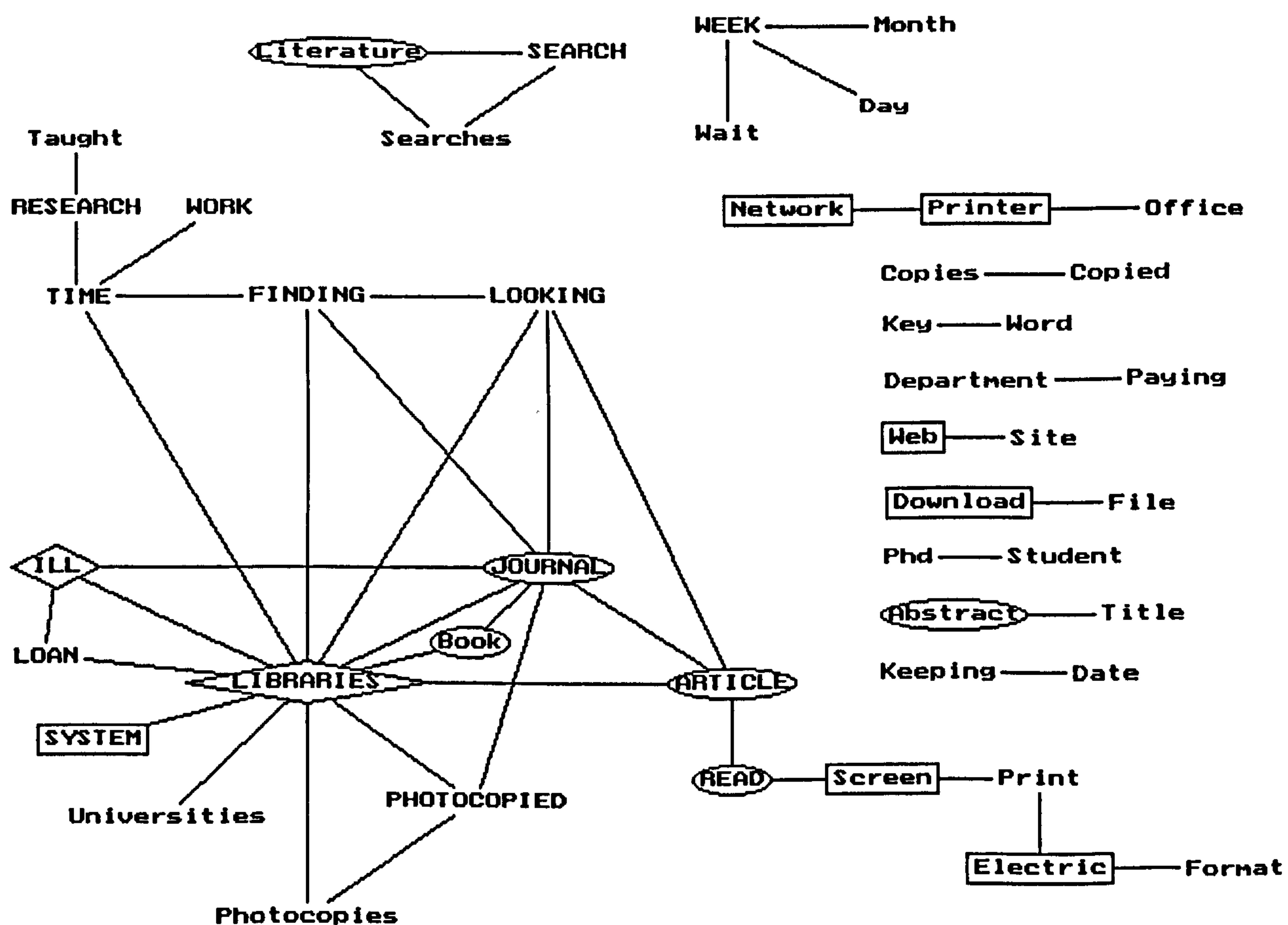
As in Figure 5 (the corresponding diagram for the whole researcher interview corpus), at this high threshold value of the association index we can make out the central position of 'Libraries', which seems to be associated with a number of clusters, including:

- {ILL-Loan}
- {Finding-Time}
- {Journal-Looking-Article}
- {Photocopied-Photocopies}

In addition, a similar set of dissociated clusters is apparent as in Figure 5 that are not connected to 'Libraries' at this threshold level. These include {Wait-Week-Day} and {Network-Printer-Office}. Finally, there is a similar set of dyads to that in Figure 5 that seem to be so closely related semantically as to be idiomatic in this domain, for example 'Key-Word'. Although more central than technology words, scholarly communication words are less central to the diagram than they were in Figure 5. Technology words are

again more common in the small clusters not connected to the main network at this threshold value. Information chain words are, again, limited to the {ILL-Libraries} dyad. If we increase the detail by decreasing the threshold value, we get Figure 17. Again, I have tried in Figure 17 to maintain the layout of Figure 16 so that it is clear how Figure 17 has grown from Figure 16.

Figure 17: The global association network diagram from the benchmarking interview corpus (2)
(threshold $S = 0.05$)



Again, the first thing to note is that at this threshold level of the association index, $S=0.05$, the diagram has become less legible. The central position of 'Libraries' is still discernible, and several links have been added to that main network. None of the dissociated clusters have been linked into the main network, although two of the three, {Literature-Searches-Search} and {Wait-Week-Day} have been expanded. There are

also more dyadic pairs, some of which are more obviously idiomatic than others. Scholarly communication words have become more central to the main network than they were in Figure 16, although technology words have been incorporated, for example, the dyad {Electric-Format}. As was the case in with the whole corpus, the only place where the two categories are directly related are at {Read-Screen} toward the bottom-right of the main network. The information chain remains represented by {ILL-Libraries}. Once again, it is difficult to read beyond this level from the global association diagrams. The other dimension being used to relate words was inclusion, and a corresponding global inclusion diagram is shown in Figure 18.

Figure 18: The global inclusion network diagram from the benchmarking corpus (threshold I = 0.5)

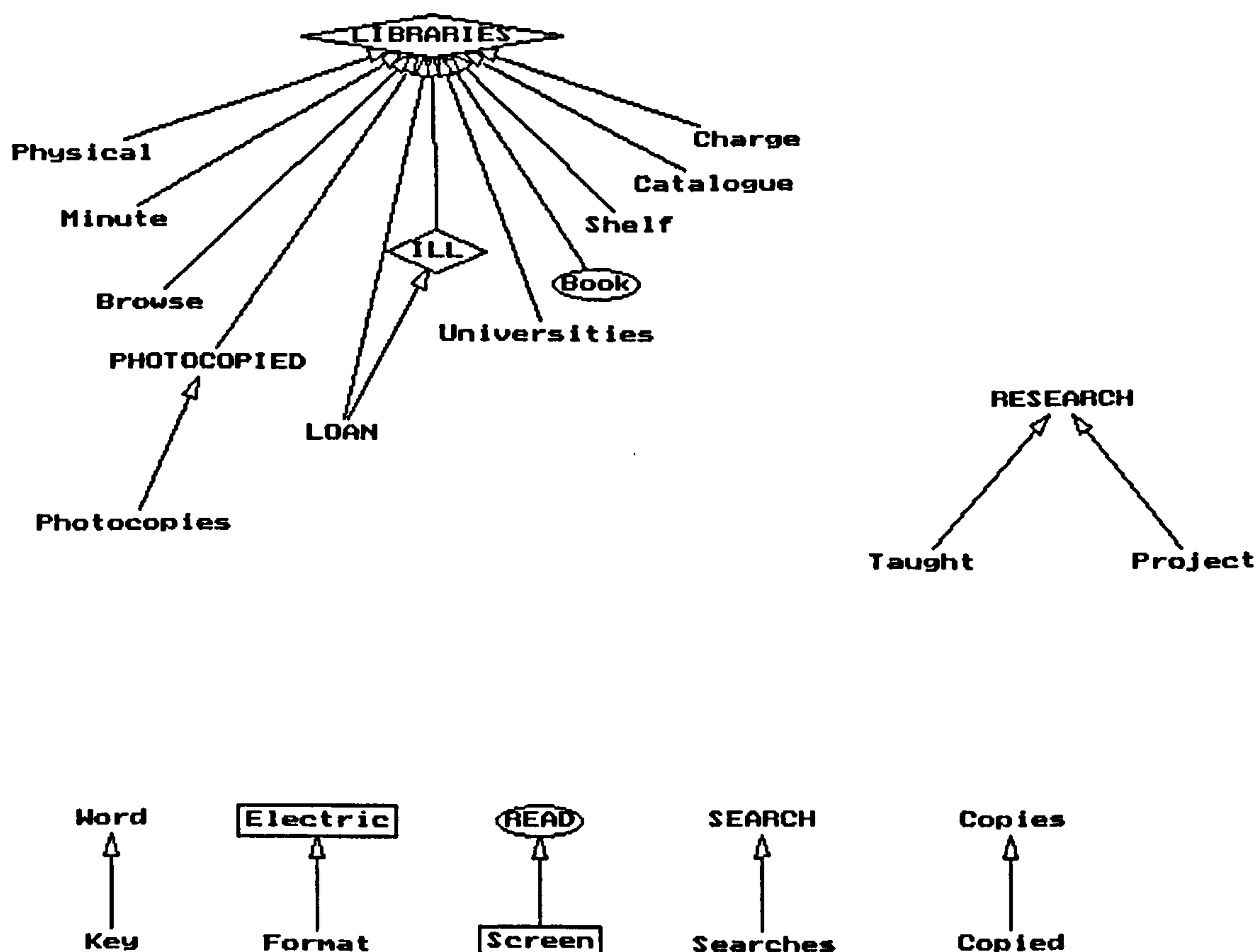


Figure 18 confirms the central position of 'Libraries' in the actor-network in the corpus, with a large number of words tending only to appear in combination with it. 'Libraries' is the only significant pole in Figure 18. In addition, we can see the hierarchical nature of

the clusters {ILL-Loan-Libraries} and {Photocopies-Photocopied-Libraries}. There is less variety in the words included by 'Libraries' than was the case in the whole corpus.

Among these words are:

- 'Catalogue', 'Shelf' and 'Browse';
- 'ILL', 'Loan' 'Charge'.

Thinking in terms of the actor-network, 'Libraries' is clearly the major centre of translation within the discourse of researchers in the benchmarking interviews, its fairly heterogeneous actor-network linking elements conventionally categorised as temporal, financial and service-oriented. Whereas the information chain dyad {ILL-Libraries} is, obviously, an important part of the 'Libraries' actor-network, technology words are not in the actor-network at the resolution of the global diagram. Of the scholarly communication words, only 'Book' is linked into the 'Libraries' actor-network. Figure 18, like Figure 7, also shows the many of the dyadic pairs from the association diagrams to be highly hierarchical.

It is difficult to infer much more from the global network diagrams for the benchmarking interview corpus. Again, a finer-grained analysis was possible using the leximappe procedure, and the results of this are discussed below.

Leximappes

Figure 19: Benchmarking corpus - Leximappe A

Seed pair {Copies-Copied} $S = 0.68$

Minimum S for internal links = 0.033 Minimum S for external links = 0.050

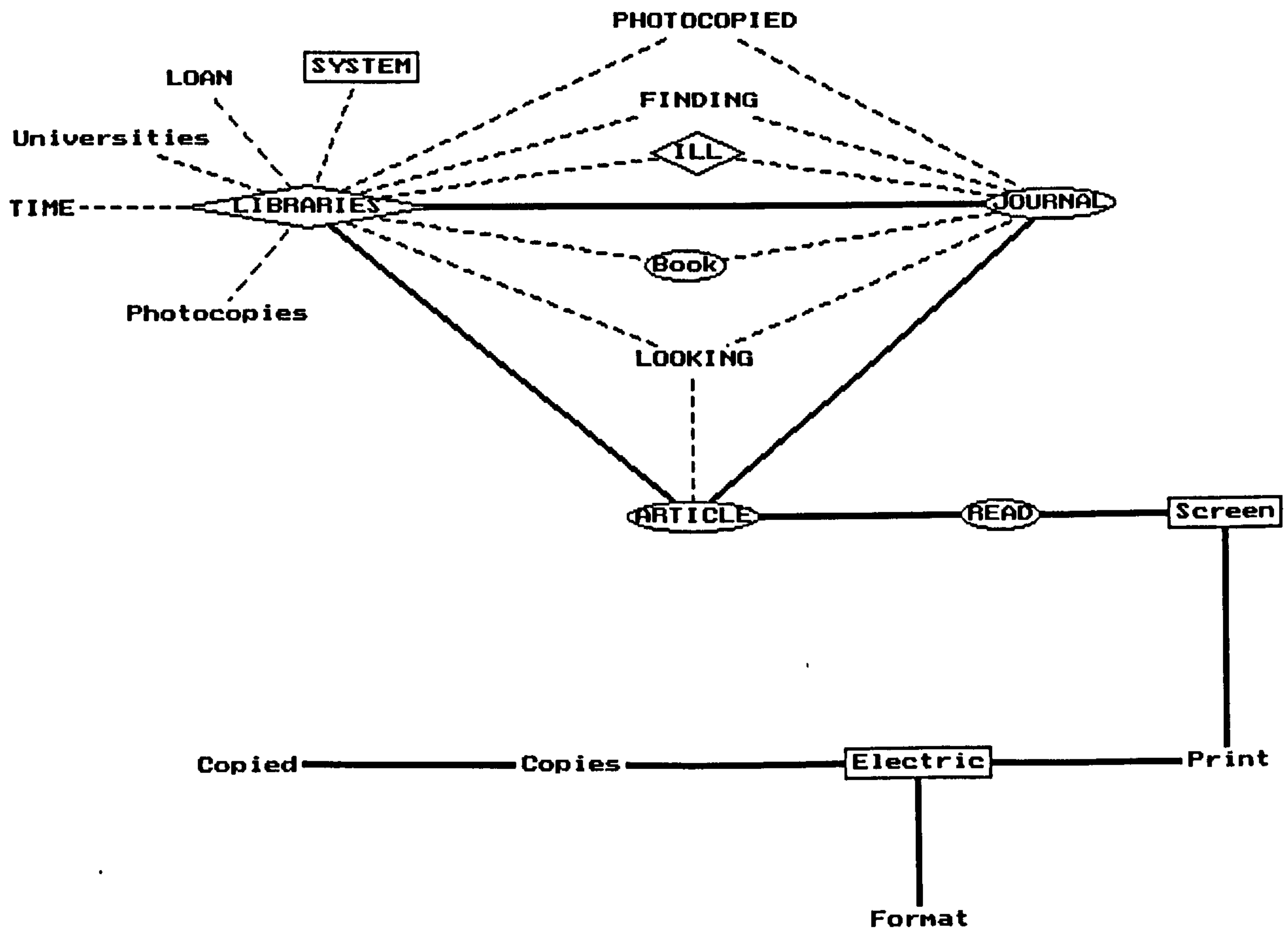


Figure 20: Benchmarking corpus - Leximappe B

Seed pair {Search-Searches} $S = 0.63$

Minimum S for internal links = 0.047 Minimum S for external links = 0.040

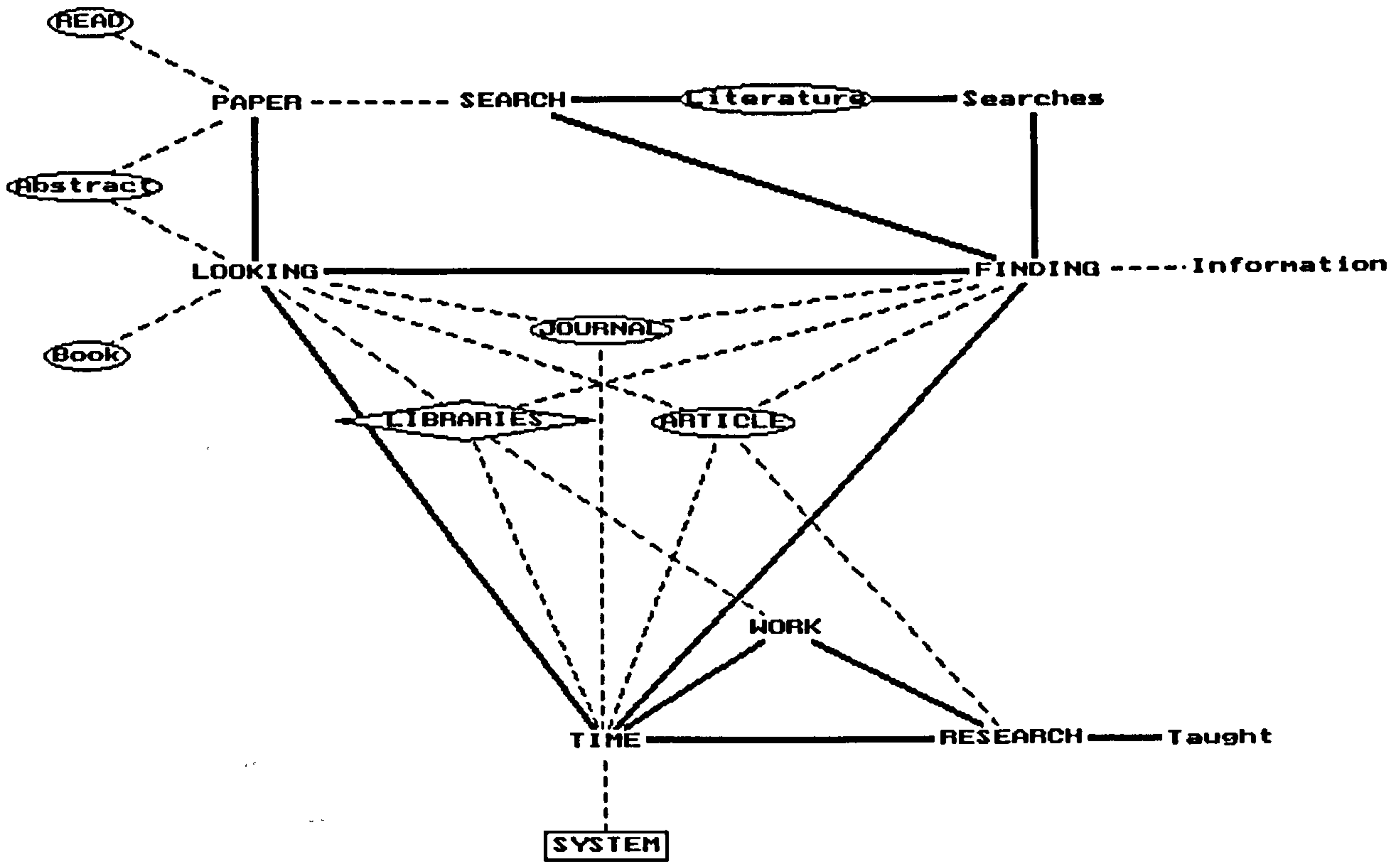


Figure 21: Benchmarking corpus - Leximappe C

Seed pair {Photocopies-Photocopied} $S = 0.60$

Minimum S for internal links = 0.027 Minimum S for external links = 0.025

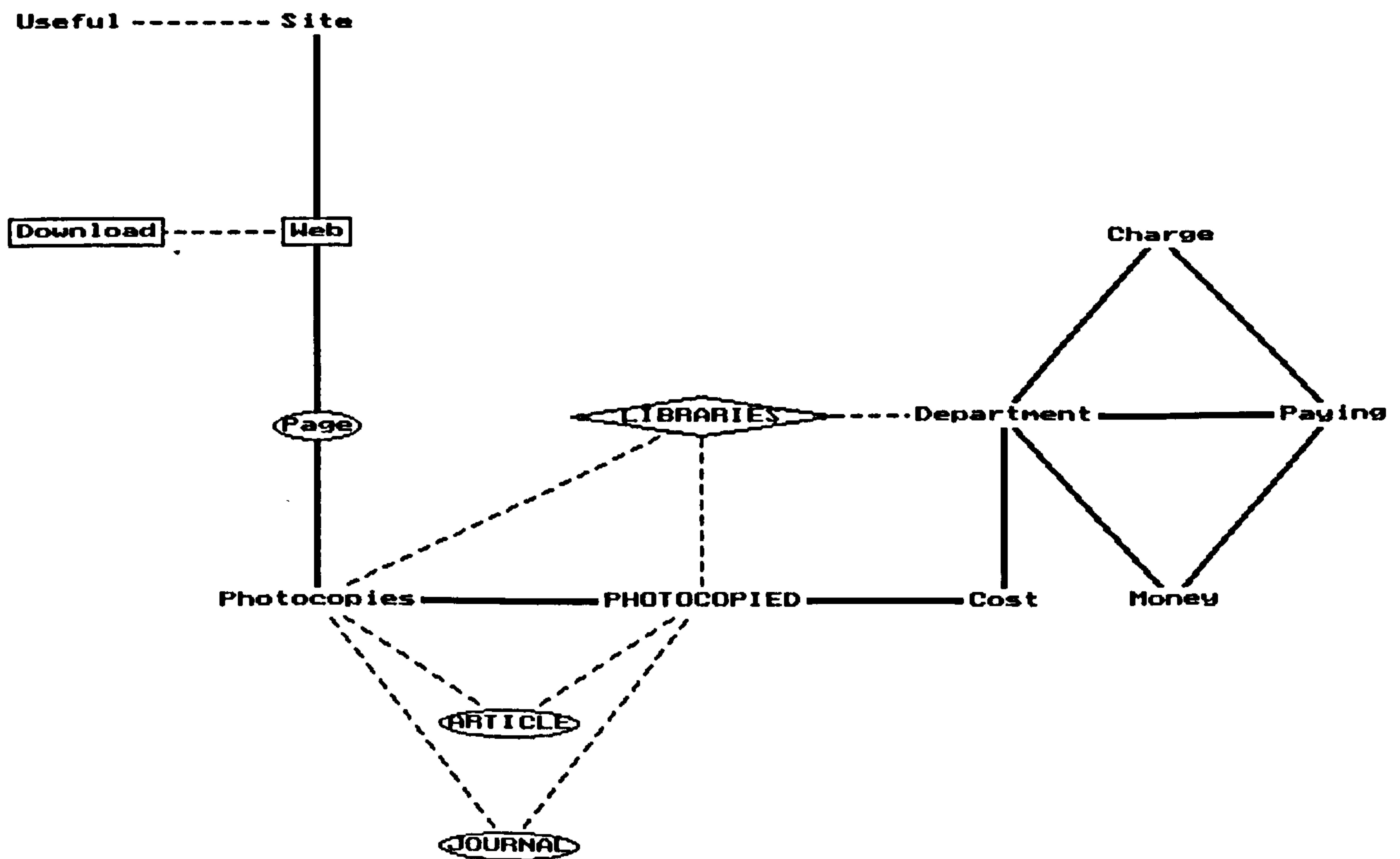


Figure 22: Benchmarking corpus - Leximappe D

Seed pair {ILL-Loan} S = 0.46

Minimum S for internal links = 0.026 Minimum S for external links = 0.030

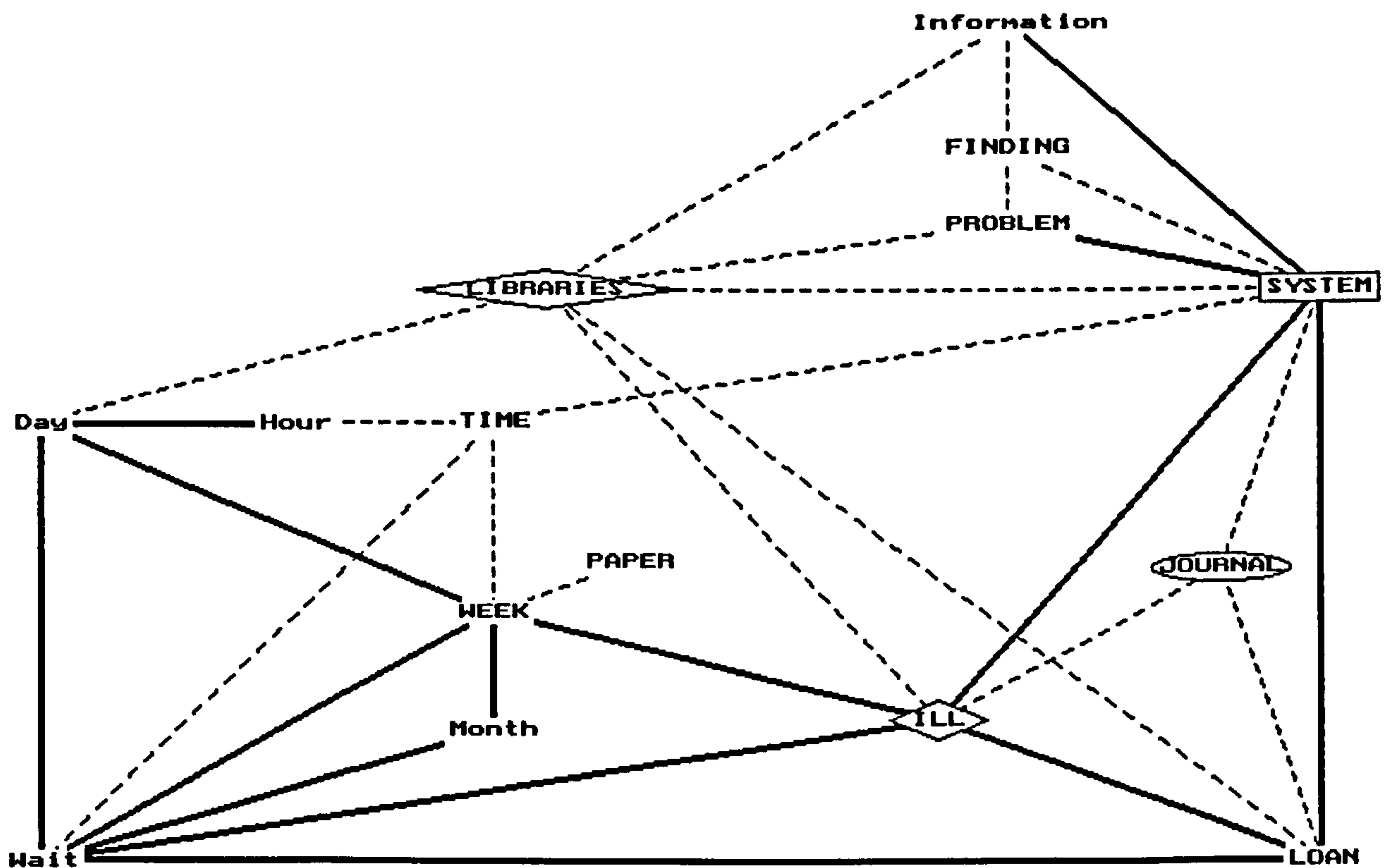


Figure 23: Benchmarking corpus - Leximappe E

Seed pair {Key-Word} S = 0.23

Minimum S for internal links = 0.0085 Minimum S for external links = 0.020

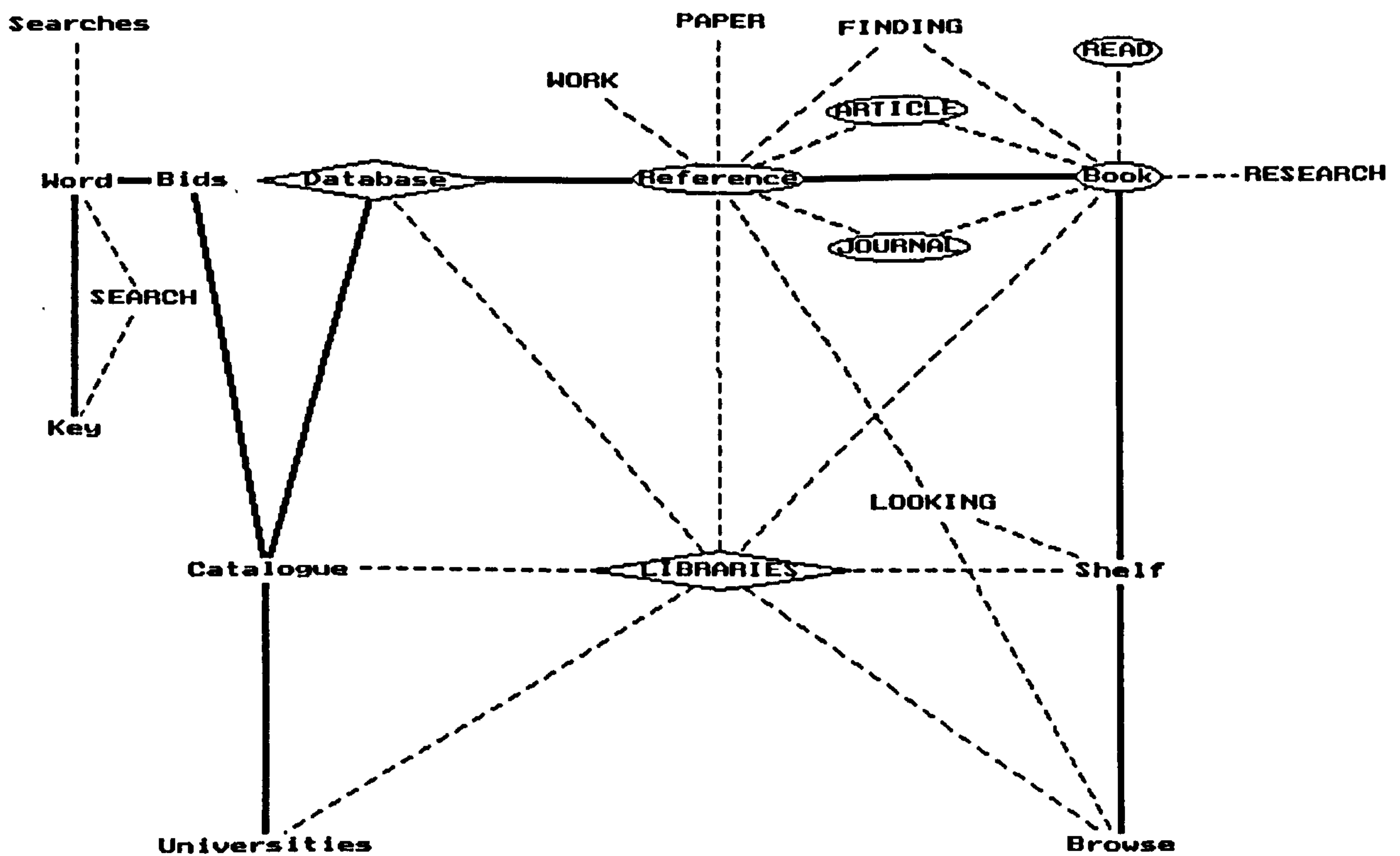


Figure 24: Benchmarking corpus - Leximappe F

Seed pair {Network-Printer} S = 0.11

Minimum S for internal links = 0.024 Minimum S for external links = 0.020

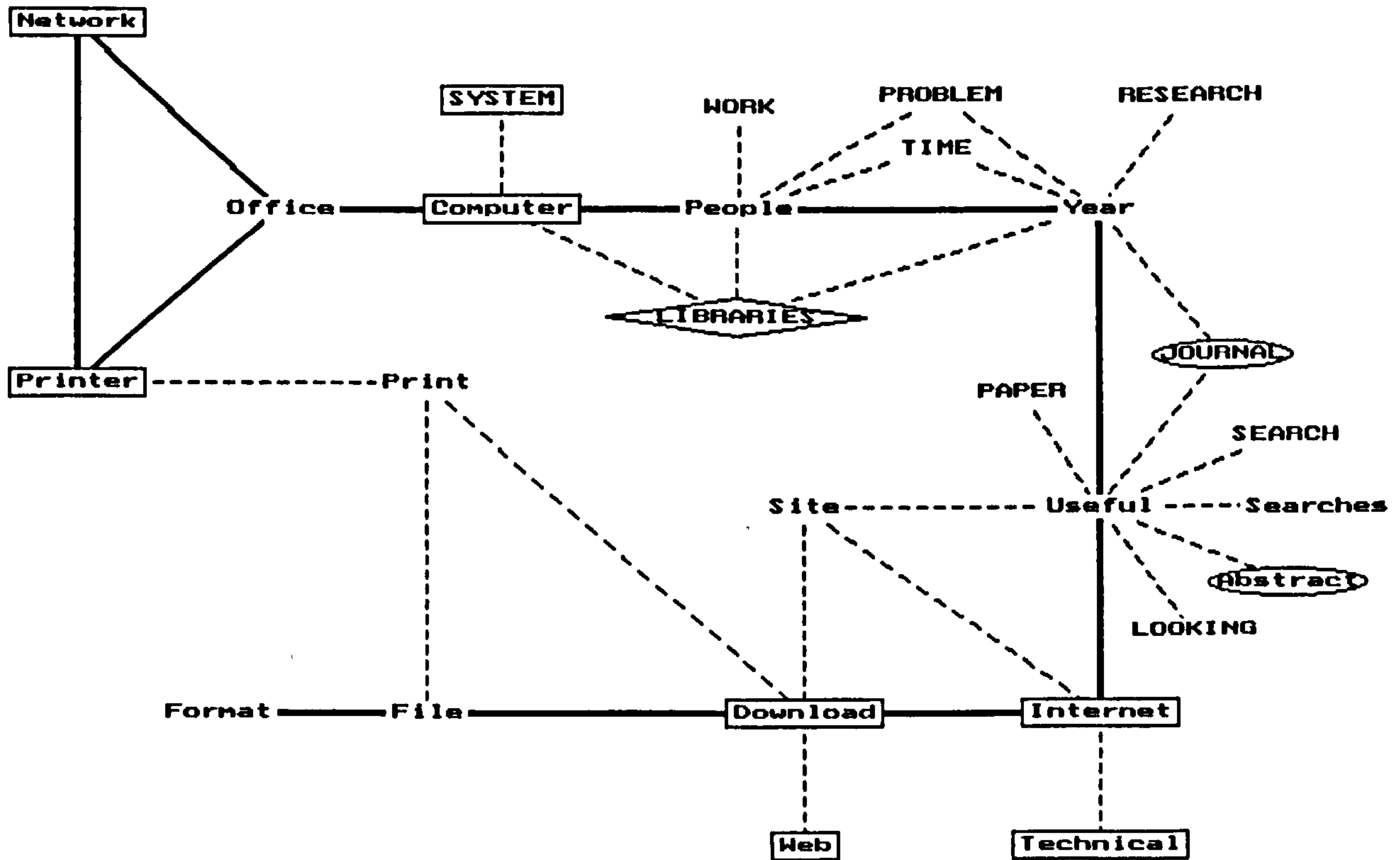
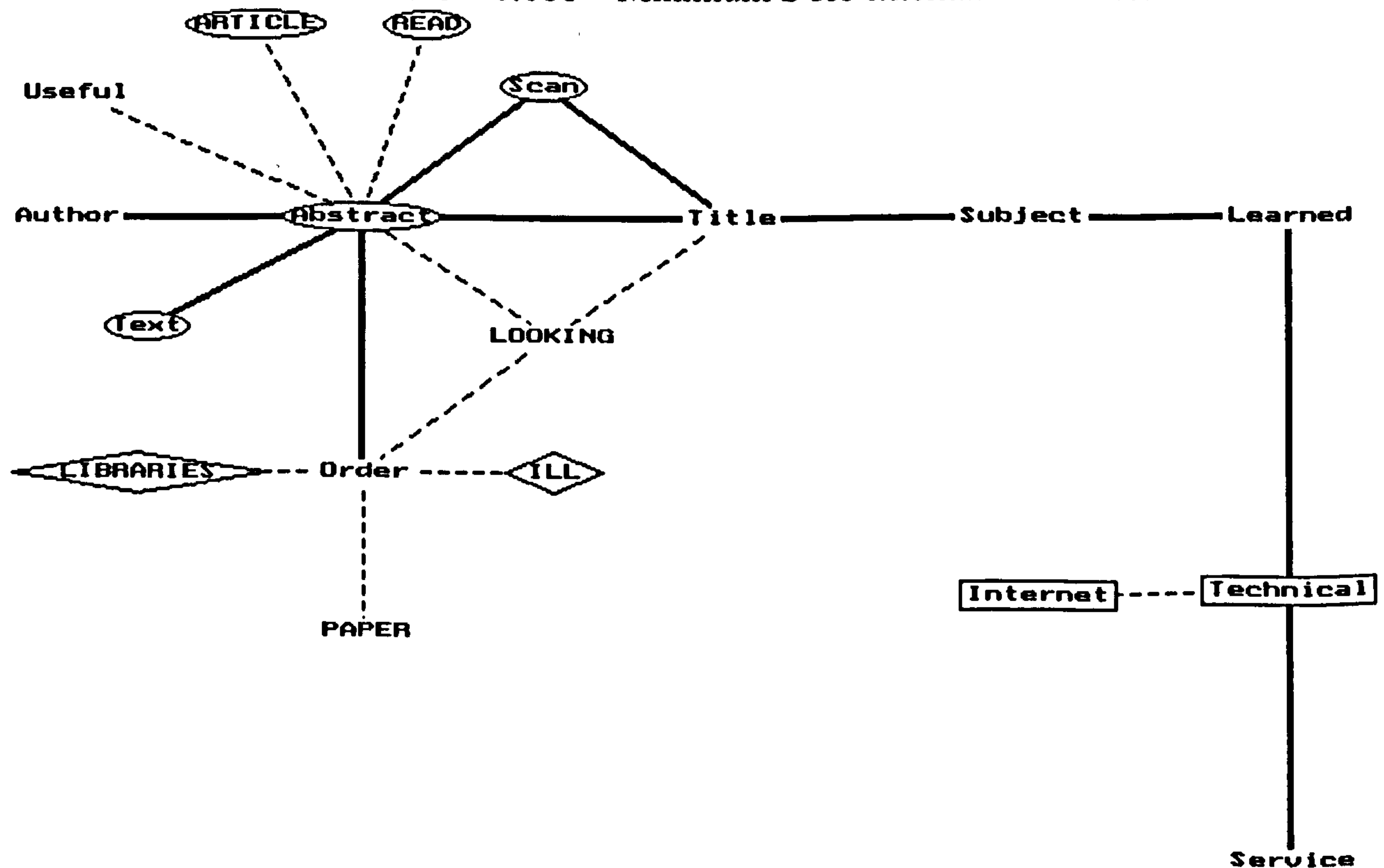


Figure 25: Benchmarking corpus - Leximappe G

Seed pair {Abstract-Title} S = 0.056

Minimum S for internal links = 0.011 Minimum S for external links = 0.020



Again, these leximappes show considerable structure and a close relationship with the global network diagrams. Leximappe A (Figure 19) includes the central triad from the global network, which is, as it was for the whole corpus, {Libraries-Journal-Article}. Following the pattern of the Leximappe A for the whole corpus (Figure 8), Figure 19 relates this triad to the cluster {Read-Screen-Print} and thence to the dyad {Copy-Copies}. Leximappe B for the benchmarking interviews is also similar to that for the whole corpus, being centred on {Time-Looking-Finding} and relating this to {Literature-Searches} and to 'Research' and 'Work'. This corresponds to the top region of Figure 17, the global network diagram. Continuing the trend, Leximappe C for the two corpora are also similar, including {Department-Paying-Cost}, {Photocopied-Photocopies} and {Web-Page}. At Leximappe D, however, the similarity ends. Whereas {ILL-Loan} was in Leximappe A for the whole corpus, it does not appear until Leximappe D for the benchmarking interviews, and is strongly associated with a temporal cluster {Wait-Week-Month-Day-Hour}. This temporal cluster appears in Leximappe G for the whole corpus and is there associated via an external link to 'ILL'. Leximappe E for the benchmarking interviews (Figure 23) has some relation to Leximappe D for the whole corpus, containing {Key-Word} and {Database-Reference-Book}. However, Figure 23 seems closer to existing library services {Browse-Shelf}. Leximappe F for both the benchmarking interviews and the corpus as a whole are very similar, being based around {Network-Printer-Office}. The main difference between the two is that the benchmarking interviews seem to include more technology words around 'Internet' than does the equivalent leximappe for the whole corpus. Finally, Leximappe G is unlike any of the whole corpus leximappes, although it does include {Abstract-Title-Text} from Figure 11.

Synthesis

These leximappes offer a wealth of detail on the semantic relations in the benchmarking interviews, but it is not easy to infer from them an overall view concerning the focus of the present analysis, formal scholarly communication, the academic information chain

and machinic technology. Hence, and as above relating to the corpus as a whole, a synthesis diagram was constructed to assist in this inference.

Figure 26: Benchmarking interview corpus - Synthesis diagram

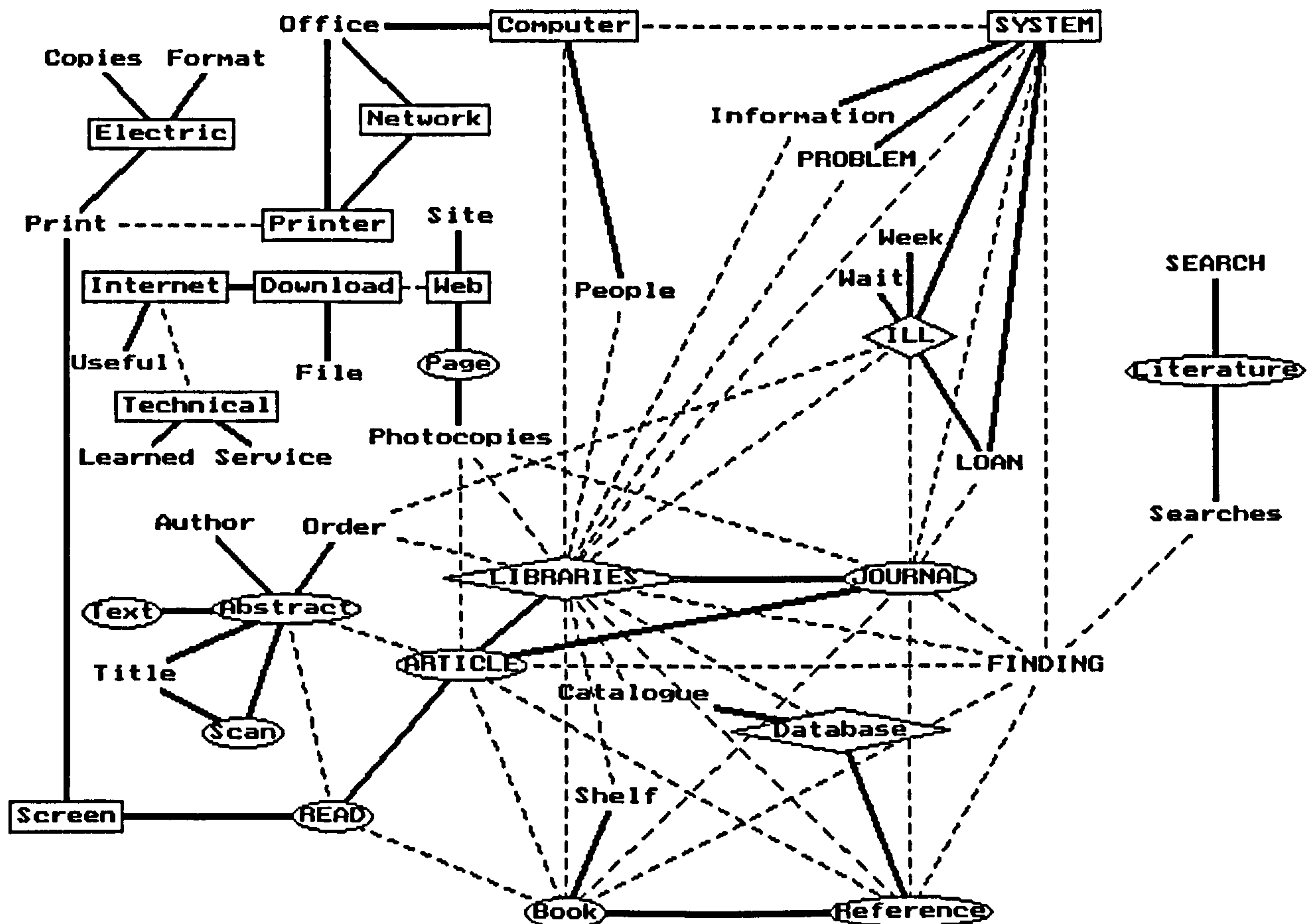


Figure 26, like Figure 15 (the equivalent diagram for the interview corpus as a whole), shows that the categories of scholarly communication and technology are largely separate, with the information chain again represented by {ILL-Libraries} and 'Database'. Scholarly communication words are mainly toward the bottom of the network, whereas technology words are mainly toward the top and the right. Again, with the exception of 'Literature', scholarly communication seems to be a fairly discrete category, although the only non-category word holding a central position in this case is 'Finding', compared with 'Paper' in Figure 15. We can conclude from this that the location of material was a relatively major concern in the benchmarking interviews. Technology again seems to be a much less discrete category and is perhaps best described

in terms of three main sub-categories, two of which are distinct to those identified from Figure 15. Firstly, there is the region to the top-right, {Network-Printer-Office-Computer}, which was also visible in Figure 15 and is again only weakly held into the network. Secondly, and relatedly, there is the cluster {Electric-Print-Screen} at the left edge of the network, which links with the scholarly communication subnetwork at 'Read'. Finally, there is a region to the left of the centre of the diagram {Web-Download-Internet-Technical}, which is also associated with the scholarly communication words, this time via 'Page' and 'Photocopies'.

Close inspection shows that these two boundary regions between scholarly communication and technology are very similar to those found in Figure 15; they are again concerned with transforming networked access into readable documents via the processes of photocopying, downloading and printing. If the scholarly communication - technology boundary was similar to that for the corpus as a whole, then so was the information chain - technology boundary, which included {System-Information-Problem} and {Computer-People}. Note, however, that {Access-Internet} is not present whereas 'ILL' is far more central in Figure 26 than in Figure 15. The final boundary region, between scholarly communication and the information chain, is more extensive in Figure 26 (benchmarking interviews) owing to the greater links between {ILL-Libraries} and {Journal-Article} and {Order-Abstract}, and also via 'Database' to 'Reference'.

If the network for the benchmarking interview corpus is so similar to that of the whole researcher interview corpus, then how might that for the evaluation interview corpus differ? It is on to this question that I now move.

3. Evaluation interviews

As noted in the methodology section, above, the interviews could be divided according to whether they served to benchmark the current practice of researchers or to evaluate electronic document access systems. This section is concerned with the evaluation interview corpus, which amounted to 63 interviews. As above, the results are given in the following order:

- Graphical estimation of the core words used most frequently;
- Global network showing the overall distribution of the words in the interviews according to the S (association) and the I (inclusion) indexes;
- Leximappes for the evaluation corpus;
- Synthesis of leximappes to show ‘scholarly communication’, ‘information chain’ and ‘technology’ networks in relation to each other.

Graphical estimation of the core

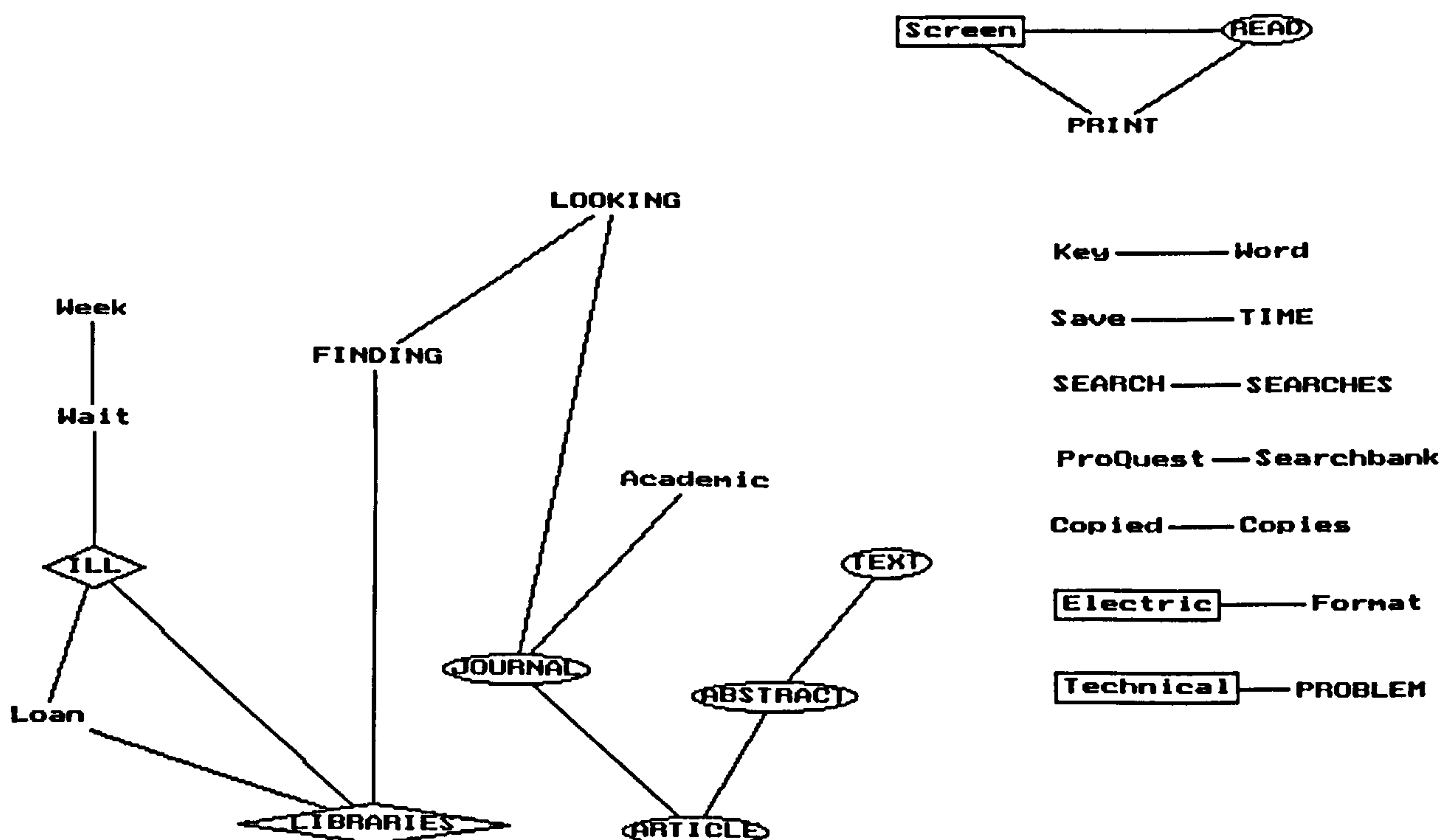
The core of words for the evaluation corpus was estimated graphically from the Bradford-like distribution of the prompt words. The non-linear section of the graph included all words ranking above Log 3.2, which gave a core of words as follows:

TIME, JOURNAL, SEARCH, ARTICLE, LOOKING, LIBRARIES, PROBLEM, SEARCHES, FINDING, PAPER, WORK, TEXT, ACCESS, DOCUMENT, SYSTEM, USEFUL, RESEARCH, PRINT, READ, AVAILABILITY, ABSTRACT, REFERENCE, DATABASE, QUICKER.

Global network diagrams

The global association network diagram for the evaluation interview corpus across all three subject areas, is shown at two threshold values of the association index in Figures 27 and 28.

Figure 27: The global association network diagram from the evaluation interview corpus (1)
(threshold $S = 0.06$)

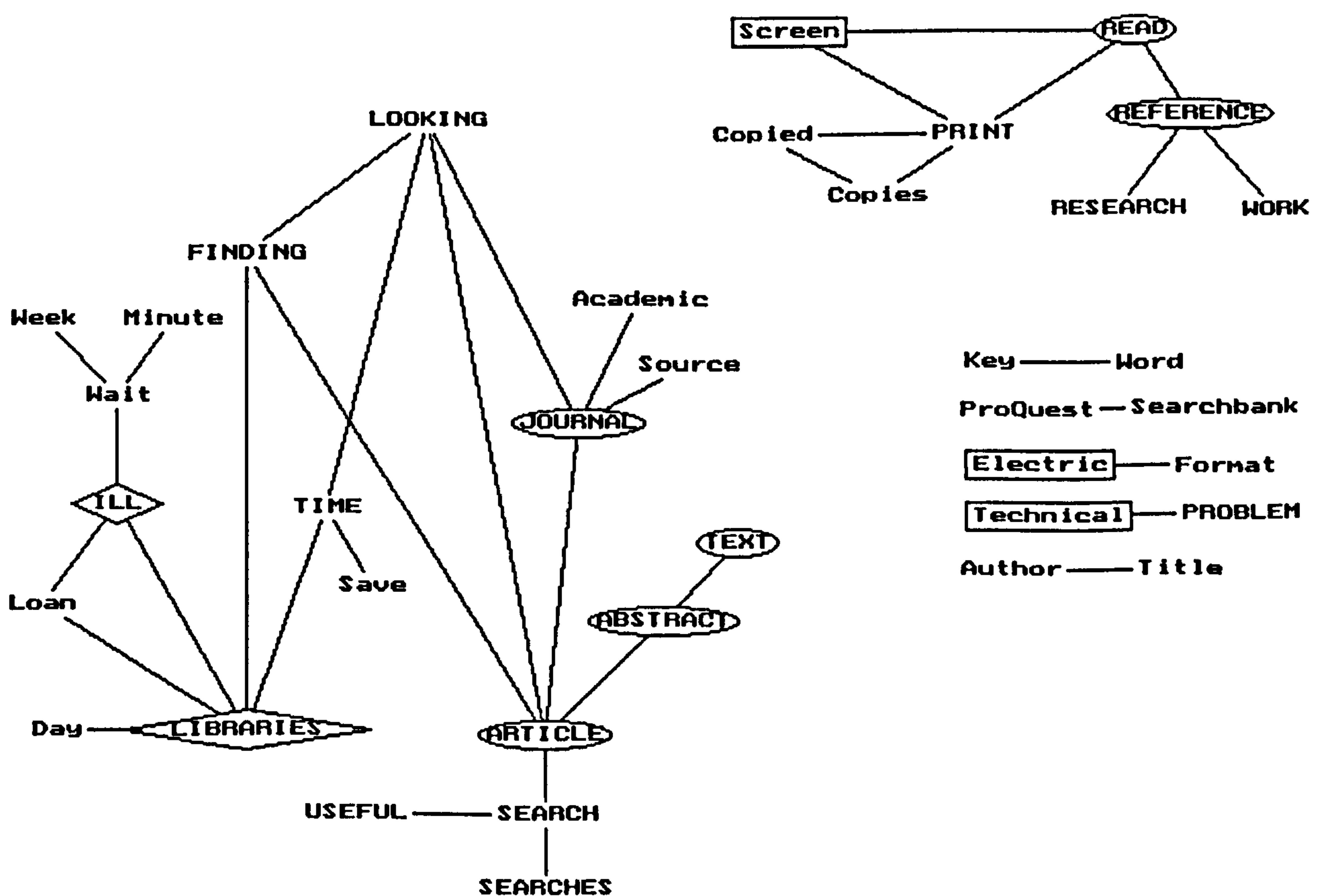


I have tried to lay this diagram out so as to aid comparison with Figures 5 and 16, the corresponding diagrams relating to the whole corpus and the benchmarking interviews only. It is clear that there are some major differences between the diagrams representing the evaluation and the benchmarking interviews. 'Libraries' is no longer central (there is no obvious centre), {ILL-Loan} has been supplemented by {Week-Wait}, 'Journal' is now linked to 'Academic', and 'Article' is now linked to {Abstract-Text}. {Read-Print-Screen} appears as a dissociated cluster at this high threshold level.

Some of the dissociated dyads are common to the benchmarking and the evaluation interviews, such as {Electric-Format}, but some are new and reflect the evaluative status of the interview corpus, like {ProQuest-Searchbank}¹¹. Once again, scholarly communication words form a major component of the main network, with technology words limited to dissociated clusters and dyads and information chain words limited to {ILL-Libraries}.

If we increase the detail by decreasing the threshold value, we get Figure 28. Again, I have tried in Figure 28 to maintain the layout of Figure 27 so that it is clear how Figure 28 has grown from Figure 27.

Figure 28: The global association network diagram from the evaluation interview corpus (2)
(threshold S = 0.05)



11. These were the names of systems being evaluated.

At this threshold level of the association index, $S=0.05$, the diagram shows two main networks, neither of which is strongly focused. The relatively central position of 'Libraries' in one of these is discernible, although 'Looking' and 'Article' are also central. Compared with the equivalent diagram for the benchmarking interview corpus (Figure 17), the information chain cluster {ILL-Loan-Libraries} has been expanded with {Wait-Week-Minute} and is not linked to the scholarly communication word 'Journal'. The second main network in Figure 28 has grown from the {Network-Screen-Print} cluster in Figure 27. In Figure 17 this cluster is attached to the main network at 'Article' via 'Read'. Here, it remains dissociated and has grown by the inclusion of the {Copied-Copies} dyad plus a cluster around 'Reference'. The other dyads from Figure 27 remain as such. These differences between the global association diagrams for the benchmarking and the evaluation interviews do not extend to the relative positions of scholarly communication and technology words; the sole meeting between them remains at {Screen-Read}.

Once again, it is difficult to read beyond this level from the global association diagrams. The other dimension being used to relate words was inclusion, and a corresponding global inclusion diagram is shown in Figure 29.

Figure 29: The global inclusion network diagram from the evaluation corpus
(threshold I = 0.4)

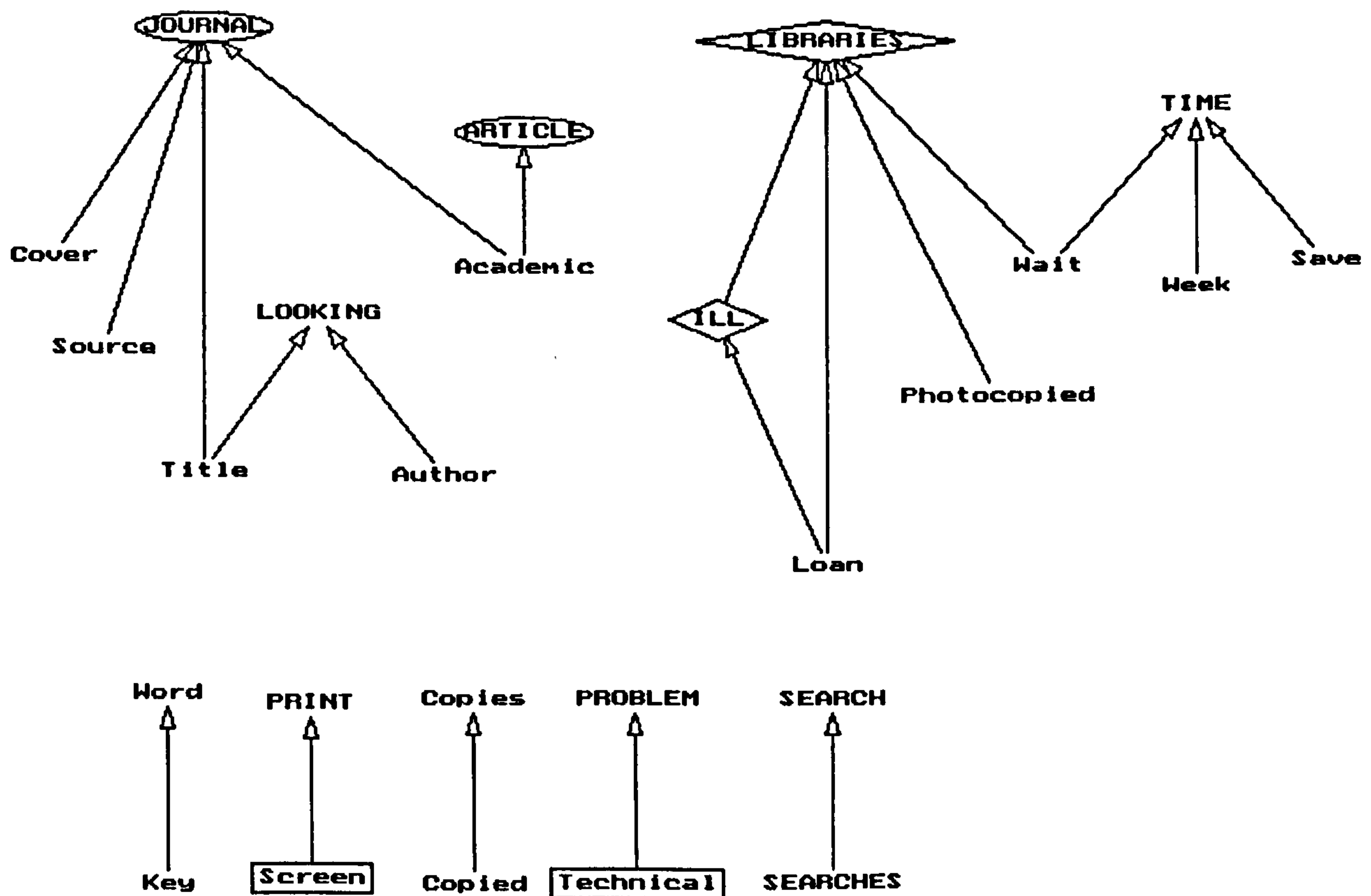


Figure 29 confirms a central position of 'Libraries' in the actor-network in the corpus, but also suggests that 'Journals' is important, along with 'Time'. Again, we can see the hierarchical nature of the information chain cluster {ILL-Loan-Libraries} and of many of the dyads from the association diagrams. The overall impression, however, is of a much flatter inclusion network than that for the benchmarking interviews (Figure 18), which implies that no single word acts as a centre of translation in the actor network. Whereas 'Libraries' dominated the interviews wherein researchers talked of current practices, no single word operated in this way when they came to talk about their use of new electronic systems.

Technology words are again limited to hierarchical dyads at the resolution of the global diagram. Of the scholarly communication words, 'Journal' and 'Article' appear to have increased in importance relative to Figure 18, signalling perhaps that these words

represent an main issue in the evaluation interviews. The information chain remains at {ILL-Libraries}. However, it is difficult to infer much more from the global network diagrams for the evaluation interview corpus. Again, a finer-grained analysis was possible using the leximappe procedure, and the results of this are discussed below.

Leximappes

Figure 30: Evaluation corpus - Leximappe A

Seed pair {Copies-Copied} $S = 0.85$

Minimum S for internal links = 0.048 Minimum S for external links = 0.040

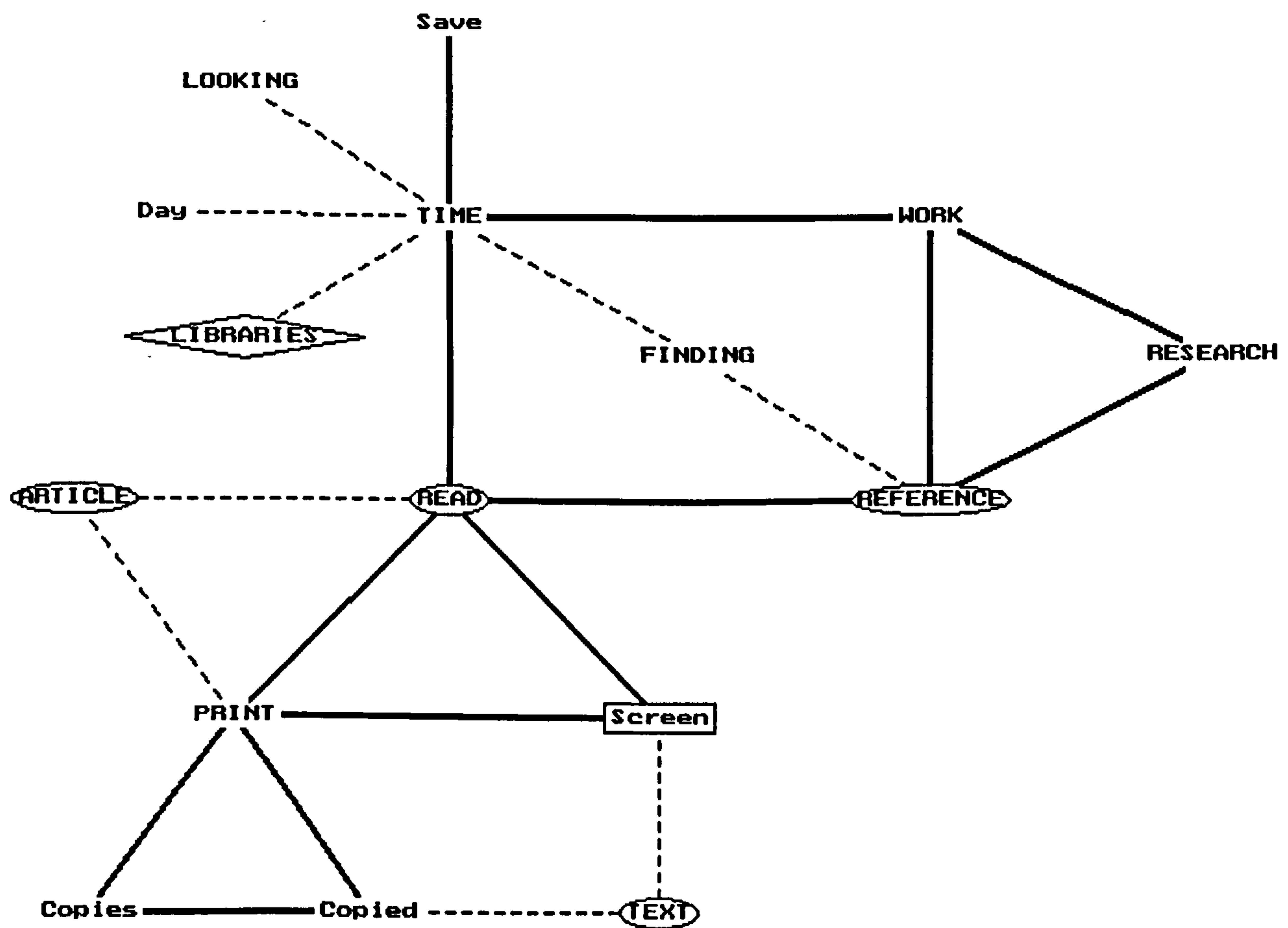


Figure 31: Evaluation corpus - Leximappe B

Seed pair {Search-Searches} S = 0.64

Minimum S for internal links = 0.057 Minimum S for external links = 0.040

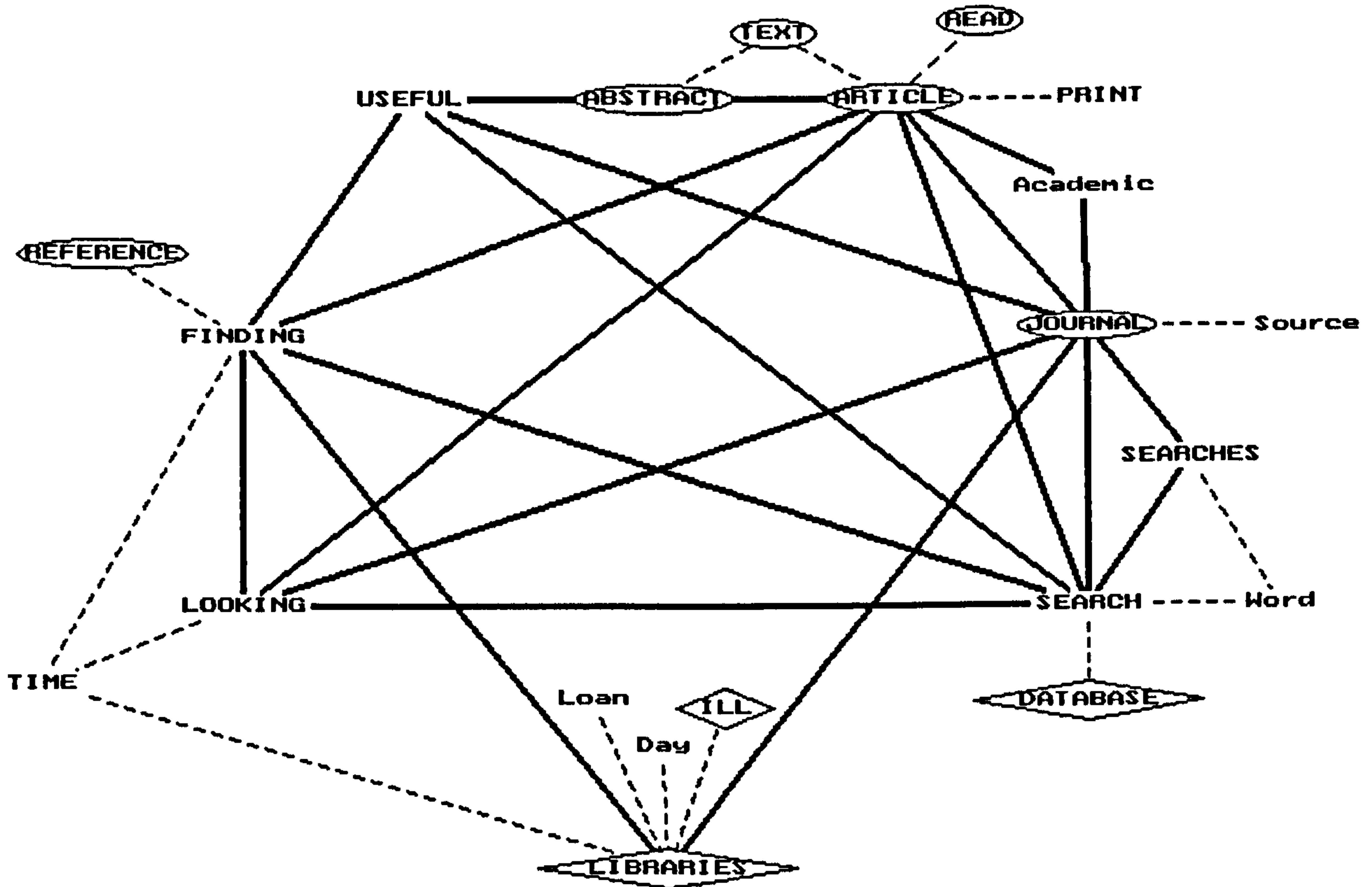


Figure 32: Evaluation corpus - Leximappe C

Seed pair {ILL-Loan} S = 0.21

Minimum S for internal links = 0.036 Minimum S for external links = 0.030

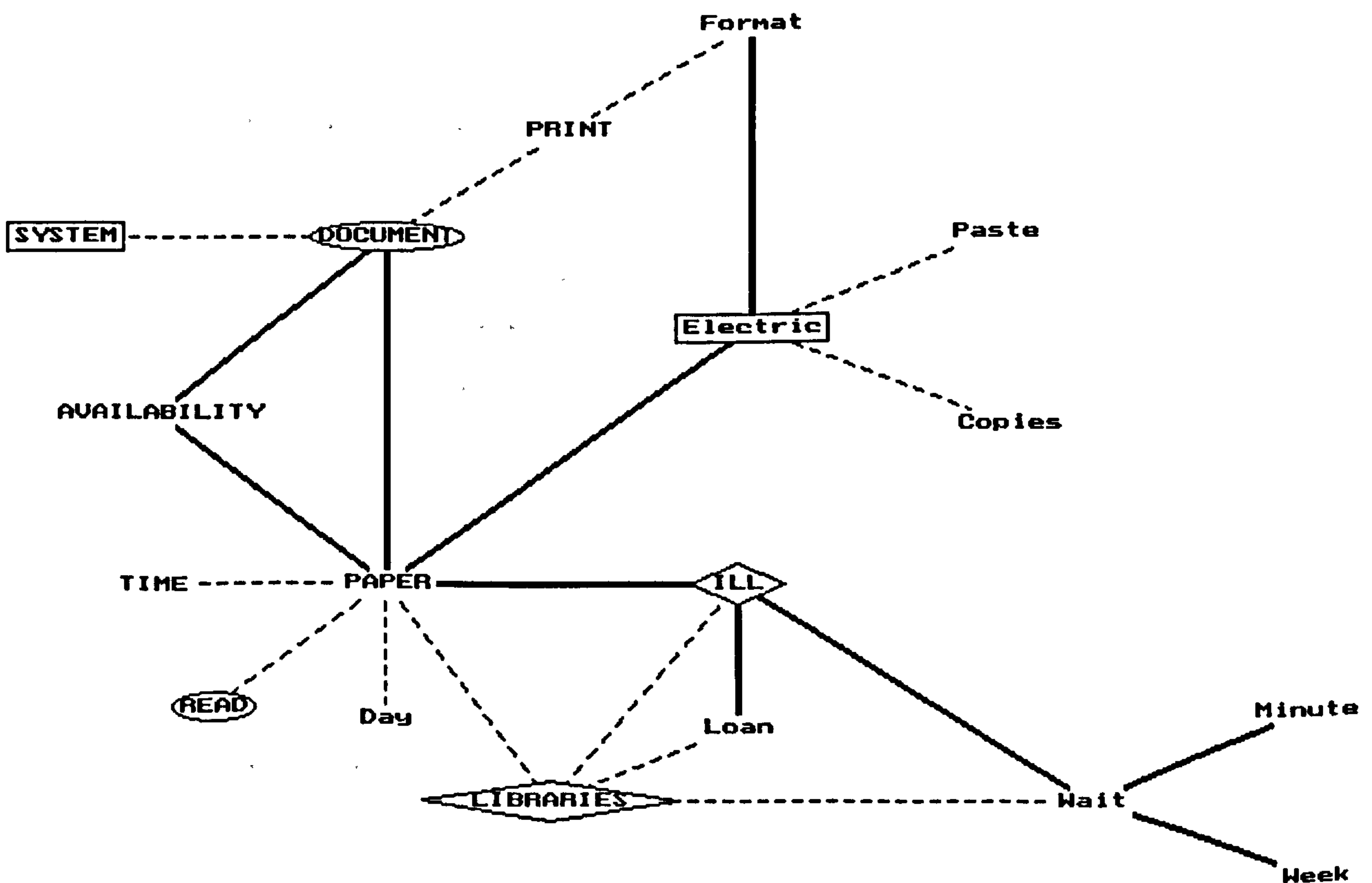


Figure 33: Evaluation corpus - Leximappe D

Seed pair {Key-Word} S = 0.14

Minimum S for internal links = 0.017 Minimum S for external links = 0.025

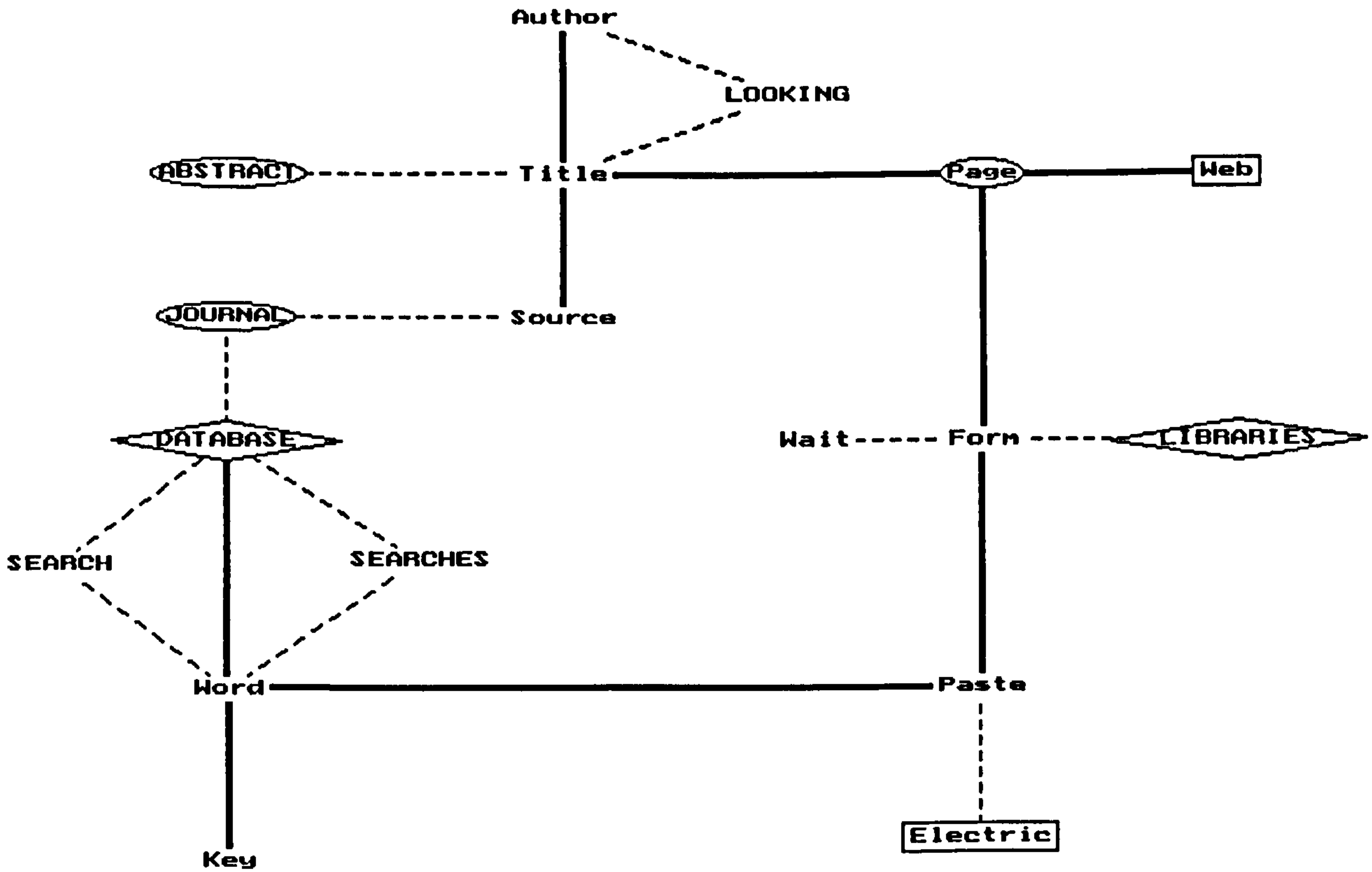


Figure 34: Evaluation corpus - Leximappe E

Seed pair {SearchBank-ProQuest} S = 0.096

Minimum S for internal links = 0.015 Minimum S for external links = 0.025

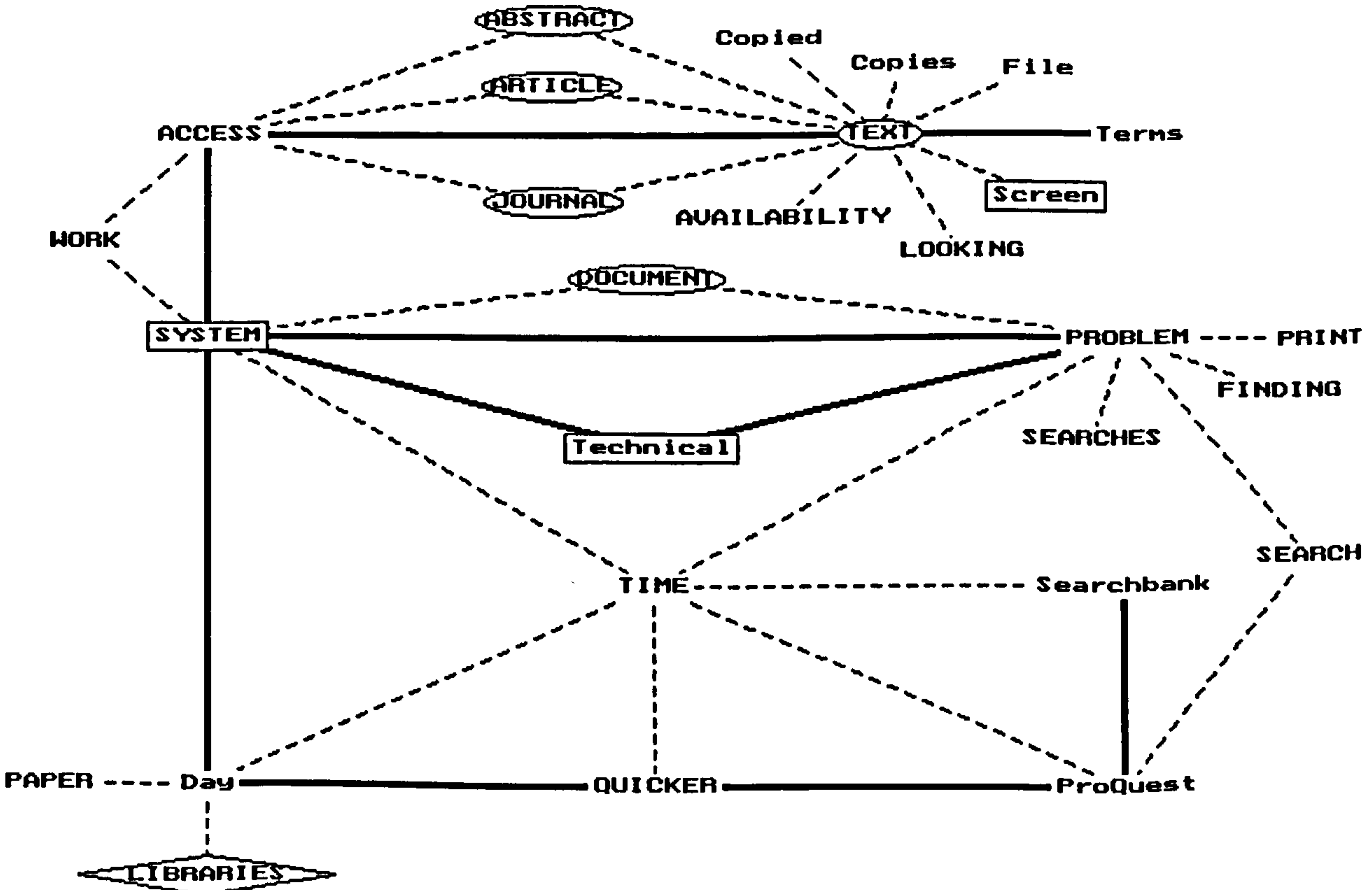


Figure 35: Evaluation corpus - Leximappe F

Seed pair {Year-Literature} S = 0.032

Minimum S for internal links = 0.011 Minimum S for external links = 0.020

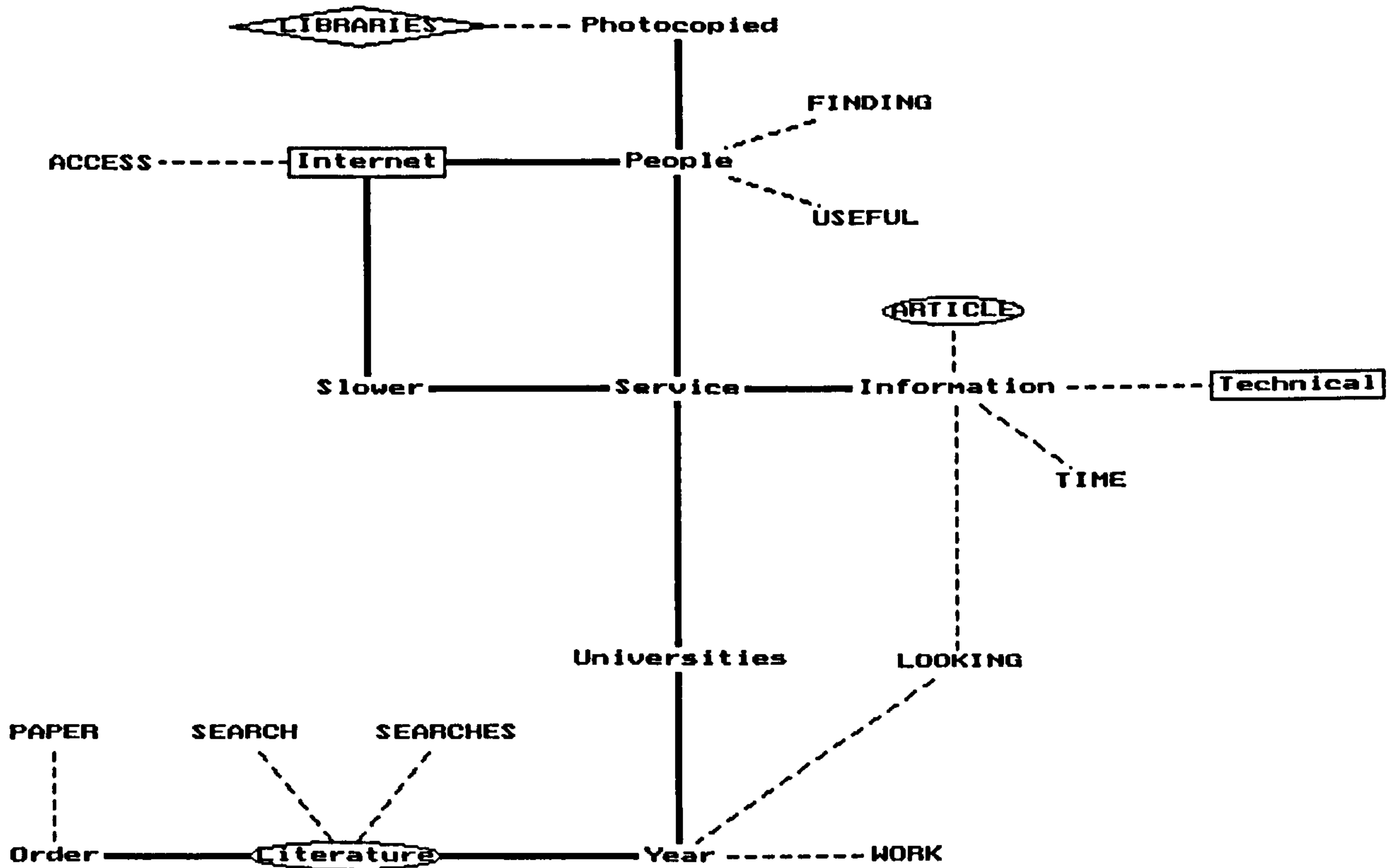
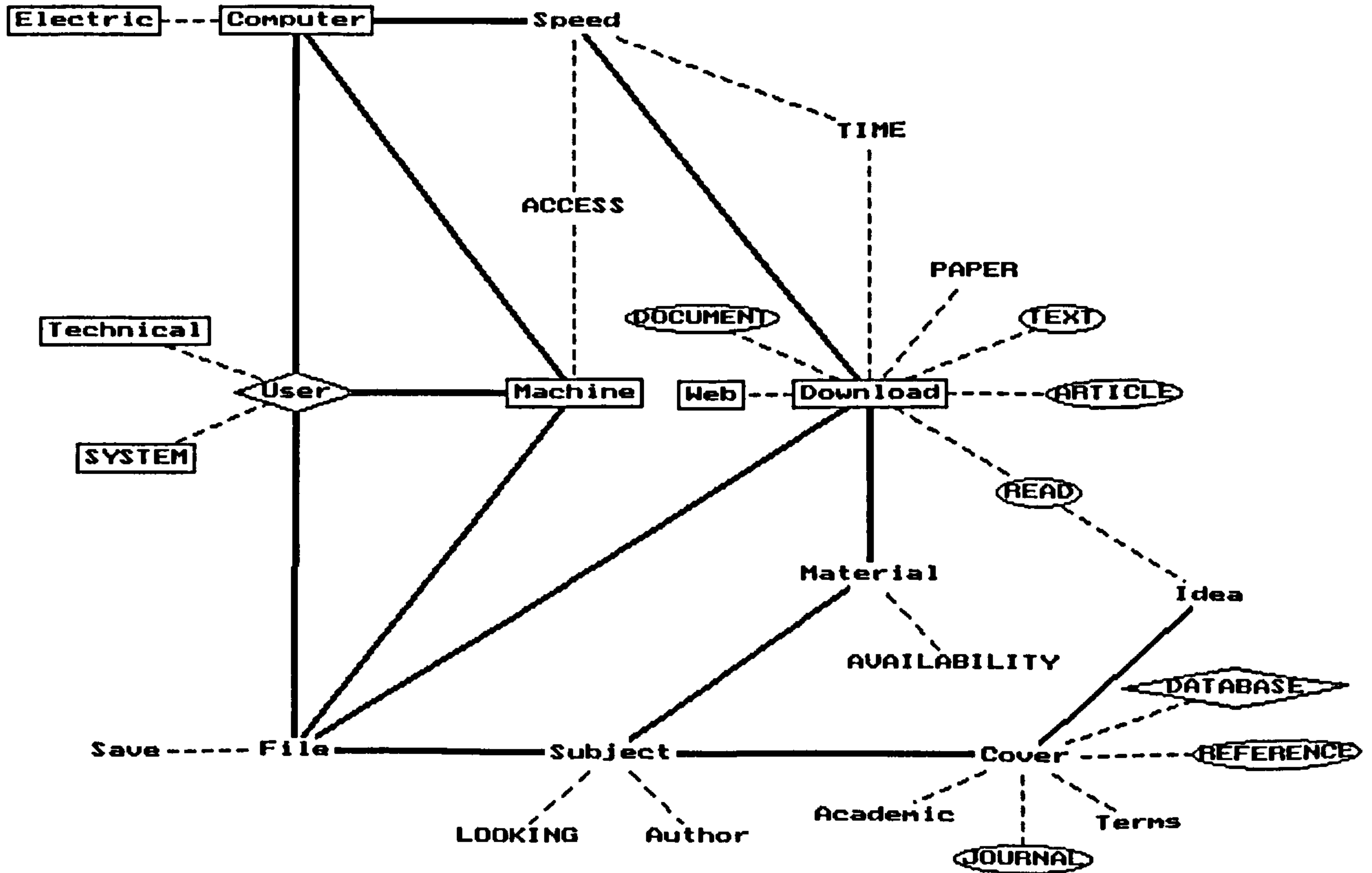


Figure 36: Evaluation corpus - Leximappe G

Seed pair {Download-File} S = 0.028

Minimum S for internal links = 0.0036 Minimum S for external links = 0.015



The leximappes for the evaluation interviews comprise a different way of putting together clusters identifiable from the global network diagrams (Figures 27 and 28) to that in the benchmarking leximappes. Leximappe A (Figure 30) begins similarly to Figure 19 - the equivalent diagram for the benchmarking interviews - with the {Read-Screen-Print} cluster and the {Copies-Copied} dyad. However, Figure 30 does not include the {Electric-Format} dyad, and links {Read-Screen-Print} with {Reference-Research-Work}. This reflects the significant difference between Figure 17 and Figure 28 (the global association diagrams for the benchmarking and evaluation interviews), which is the existence in the latter of a second major network not linked to the main one centred on 'Libraries'. The non-centrality of 'Libraries' is emphasised in Leximappe B (Figure 31), which contains what was in the benchmarking interviews the key scholarly communication cluster of {Journal-Article-Looking}. Although 'Libraries' is a part of this leximappe, it is certainly not a central one.

Leximappe C (Figure 32) shows the {ILL-Loan-Wait-Week} cluster from the global association diagram and links this through 'Paper' to both {Electric-Format} and {Document-Availability} - the latter not being apparent in the global network diagrams. In the benchmarking interviews, the ILL cluster (in Figure 22) was more embedded in temporal words (and 'Libraries'), so that we can see in the evaluation interviews how it has come to be related to issues other than time. Leximappe D (Figure 33) concerns a cluster {Key-Word-Database}, and so can be revealingly compared with the benchmarking Leximappe E (Figure 23). In the benchmarking interviews, this cluster was related via 'Reference' to {Book-Shelf-Browse}, all of which had external links to 'Libraries'. In the evaluation interviews, however, 'Libraries' has one external link via 'Form', and the leximappe relates {Key-Word-Database} with {Author-Title-Source} - which is clearly referring to common database search techniques - and to the dyad {Web-Page}. It is possible to see in this comparison a shift from library-oriented to end-user access to material. This shift can also be seen in a comparison of evaluation Leximappe E with benchmarking Leximappe D. We have seen, above, how {ILL-Loan} is only related in the benchmarking interviews to temporal words, whereas it has other connections in the evaluation interviews. In evaluation Leximappe E we can see another

aspect of this, centred on {System-Problem}. This pair was a part of the benchmarking Leximappe D with {ILL-Loan}. In evaluation Leximappe E, {System-Problem} appears in a diagram that also links temporal concerns ('Day', 'Quicker') with document access systems, this time those evaluated - ProQuest and SearchBank - rather than {ILL-Loan}. However, in evaluation Leximappe E, 'Technical' has replaced the main temporal words (and 'Libraries'), suggesting that researchers were constructing in the interviews a different type of problematic for ProQuest and SearchBank than they did for {ILL-Loan}. This may be a revealing use of 'Technical', since it suggests that the word can act as a reconfiguration of previous features of a network such as 'Libraries' and some associated temporal words.

Leximappe F for the evaluation interviews is somewhat difficult to interpret, bearing little relation to any of the benchmarking leximappes. Its only candidate cluster is {Internet-People-Slower-Service}, which would appear to suggest a performance-related link between the social and the technological. Leximappe G, on the other hand, is clearly about the category of technology as defined in this study. If we compare evaluation Leximappes F and G with benchmarking Leximappe F (Figure 24), we can see that 'Computer' has lost its association with {Office-Network-Printer} and instead become part of a complex cluster that covers most of evaluation Leximappe G. The link in benchmarking Leximappe F between 'People' and 'Computer' has been replaced in evaluation Leximappe F with {Internet-People-Slower-Service}. To get a clearer picture of the categories of scholarly communication, the information chain and technology, a synthesis diagram was constructed from the evaluation interview leximappes, which directly parallels Figure 26 relating to the benchmarking interviews.

Synthesis

Figure 37: Evaluation interview corpus - Synthesis diagram

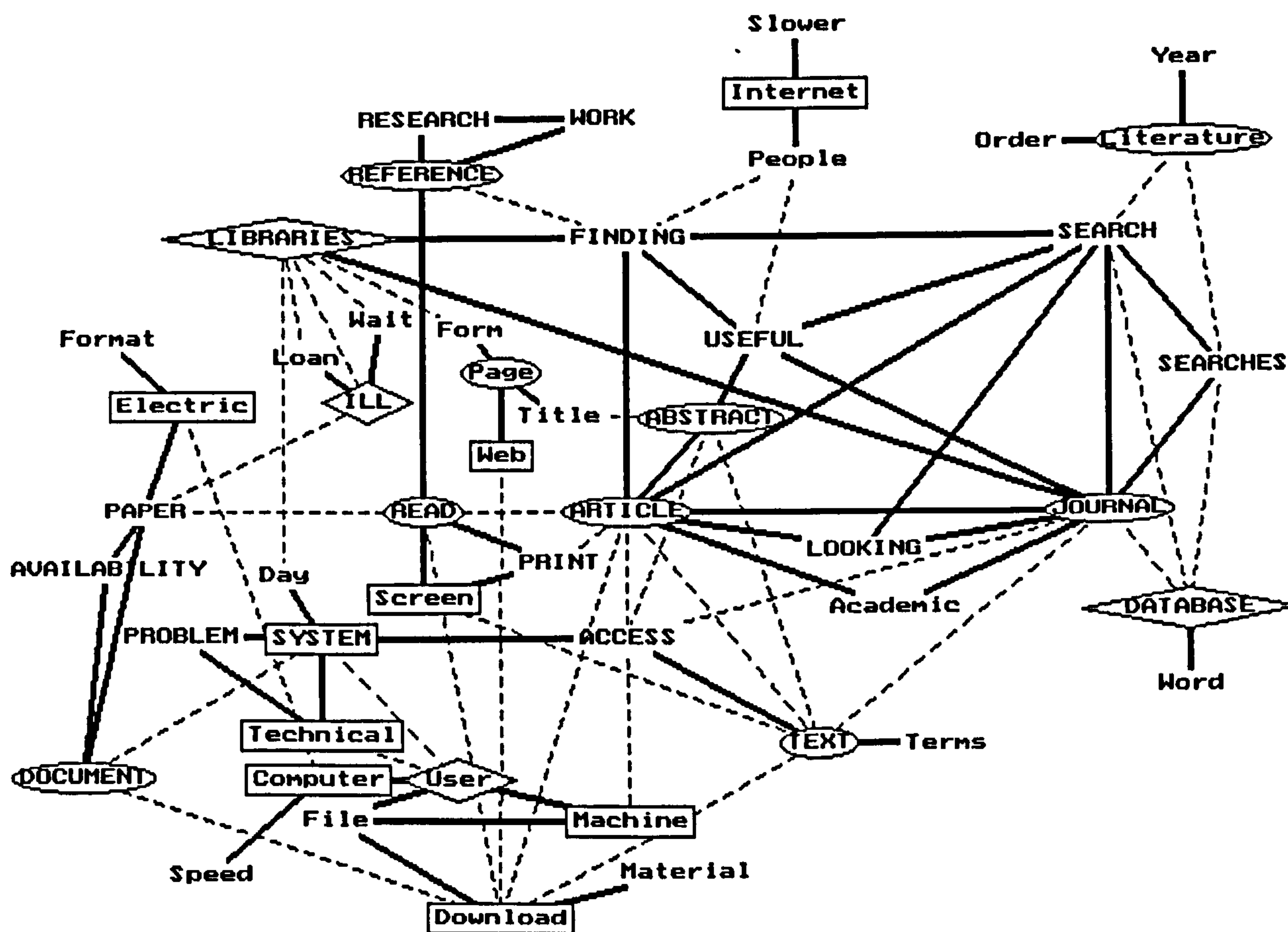


Figure 37 is more complex than Figure 26, and it is therefore harder to see the patterns of the three categories of words. Nevertheless, certain comparisons can be made between the two diagrams.

Scholarly communication is perhaps less of a discrete category in the evaluation diagram (Figure 37) than in the benchmarking diagram (Figure 26). Whereas {Literature-Search-Searches} was the only outlying cluster in Figure 26, 'Literature', 'Text' and 'Document' are all removed from the main scholarly communication network around {Journal-Article} in Figure 37. 'Document' did not feature in Figure 26 at all and 'Book' does not feature in Figure 37, so that a shift 'Book' → 'Document' can be postulated. However,

whereas 'Book' was associated with {Reference-Read}, 'Document' is associated with {Paper-Availability}, suggesting that it is a more pragmatic entity than 'Book'.

The category of the information chain is both fragmented and shifted compared with Figure 26. {Libraries-ILL} remains linked to 'Journal', but otherwise is dissociated from scholarly communication words. The words it is linked to appear to have a temporal theme ('Day', 'Wait'). 'Database', meanwhile, is linked to 'Journal' and to {Literature-Search-Searches} rather than to 'Reference'. It would seem, therefore, that compared with their positions in the benchmarking interviews, {Libraries-ILL} has moved away from scholarly communication whereas 'Database' is at least as linked the scholarly communication as it was. The new information chain word in Figure 37 is 'User', which is firmly embedded in the category of technology.

The category of technology has also changed. In this case, the category has become more discrete in the evaluation compared with the benchmarking interviews. In Figure 26, three sub-categories of technology were identifiable, whereas in Figure 37 there is clearly a main technology network around 'System' and 'Computer'. 'Web' is slightly dissociated from this, but the only wholly dissociated term is 'Internet'. Hence, we can infer that the category of technology was used differently in the evaluation interviews to how it was used in the benchmarking interviews. Whereas there were major splits in the benchmarking use of the category, this was not the case in the evaluation interviews.

Despite differences in the constitution of the two categories, scholarly communication and technology, the boundary region between them remains relatively constant between Figures 26 and 37. However, because {Web-Page} is less integral to the technology category in the latter, the major emphasis of the boundary in the evaluation interviews is at {Read-Screen-Print}. We can also see 'Access' playing an important role between the two categories.

The boundary region between the categories of the information chain and technology consists principally of {Computer-User-Machine}, and that between the information

chain and scholarly communication principally of 'Journal', compared with a much richer set of links in Figure 26. The marginalisation of 'Libraries' has led to the category of the information chain being more isolated in the evaluation interviews.

In summary, it appears that subtle differences are identifiable between the diagrams representing the benchmarking and the evaluation interviews. As we shift from the one to the other, temporal concerns associated with the library and interlibrary loan are supplemented by technical concerns associated with systems and users. The categories of formal scholarly communication and the academic information chain (as defined in and for this study) shift, becoming less discrete, whereas the category of technology becomes more discrete. The central position of journals, articles and abstracts remains constant to scholarly communication. Researchers' talk of technology becomes less associated with networks and the Internet and more concerned with practical issues of access, so picking up some of the problematics previously defined as temporal but now talked of as technical. We might characterise this as a shift from the temporal library to the technical system.

So far, we have been looking across all three of the subject areas covered in this study, business, geography and manufacturing engineering. However, the scale of the study and the flexibility of the analytic techniques allow us to focus much more specifically on each of these. Thus, what follows are three sections, each one relating to one of the three subject areas and repeating the analysis described above.

4. Benchmarking interviews with business researchers

As noted above, the interviews could be divided according to the subject area of the researchers being interviewed and also of the coverage of the document access system being evaluated in the second round of interviews. At this point we are concerned with the interviews with researchers in academic departments focusing on business. This corpus amounted to 69 interviews in total. Unlike above, the analysis is split into only two parts, relating to the benchmarking interviews and to the evaluation interviews. No analysis is undertaken of the whole subject-based corpus because this would conflate two types of interview (benchmarking and evaluation). This section is concerned with the benchmarking interviews with business researchers. There were 36 such interviews.

As above, the results are given in the following order:

- Graphical estimation of the core words used most frequently;
- Global network showing the overall distribution of the words in the interviews according to the S (association) and the I (inclusion) indexes;
- Leximappes for the business benchmarking interviews;
- Synthesis of leximappes to show ‘scholarly communication’, ‘information chain’ and ‘technology’ networks in relation to each other.

Graphical estimation of the core

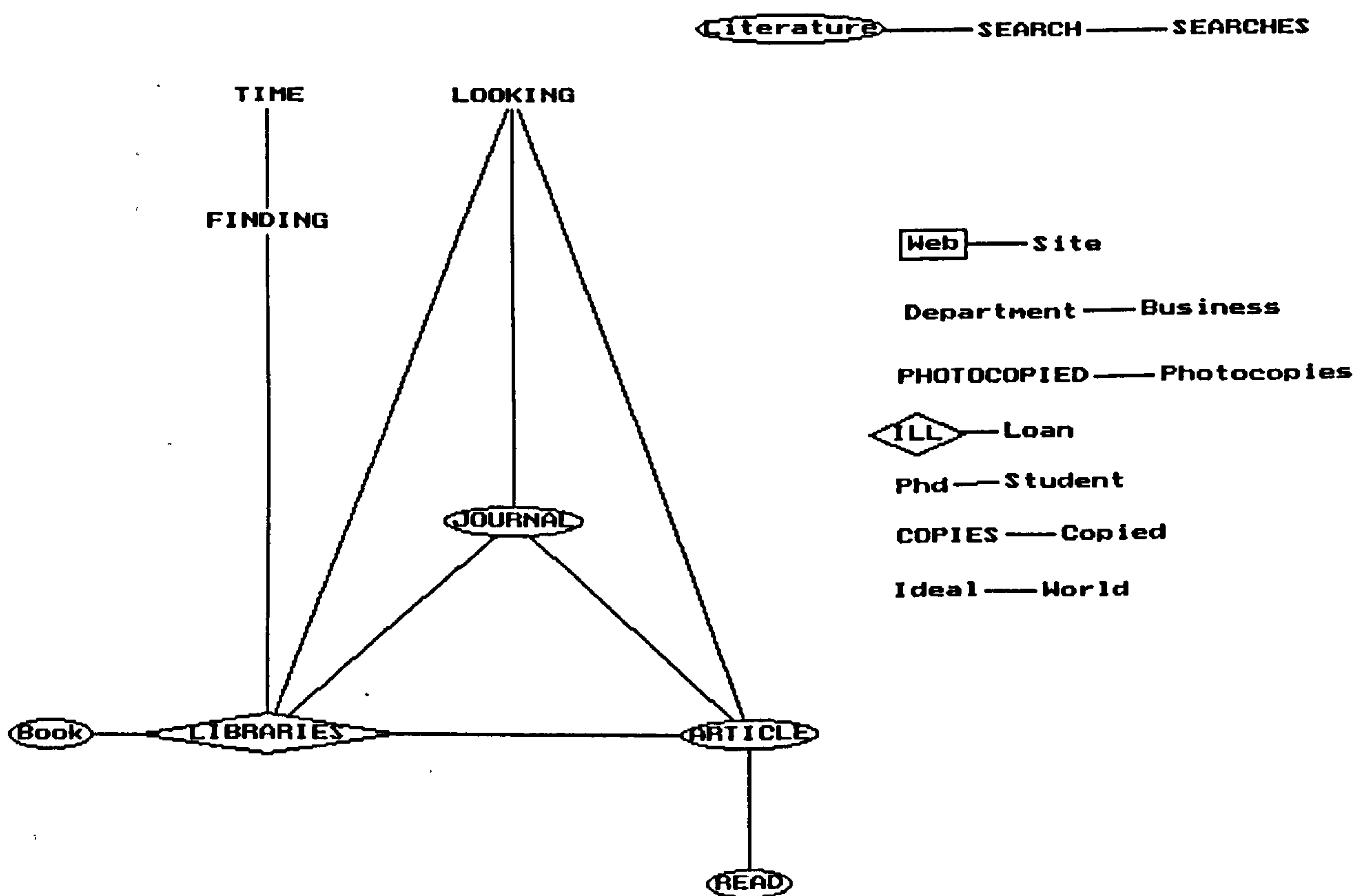
The core of words for the business benchmarking corpus was estimated graphically from the Bradford-like distribution of the prompt words. The non-linear section of the graph included all words ranking above Log 3.1, which gave a core of words as follows:

LIBRARIES, TIME, JOURNAL, ARTICLE, RESEARCH, FINDING, LOOKING, WORK, PROBLEM, SYSTEM, ACCESS, READ, ILL, PAPER, PEOPLE, SEARCH, WEEK, PHOTOCOPIED, SEARCHES, COPIES, INFORMATION, PRINT.

Global network diagrams

The global association network diagram for the benchmarking interviews with business researchers, is shown at two threshold values of the association index in Figures 38 and 39.

Figure 38: The global association network diagram from the benchmarking interviews with business researchers (1)
(threshold $S = 0.08$)

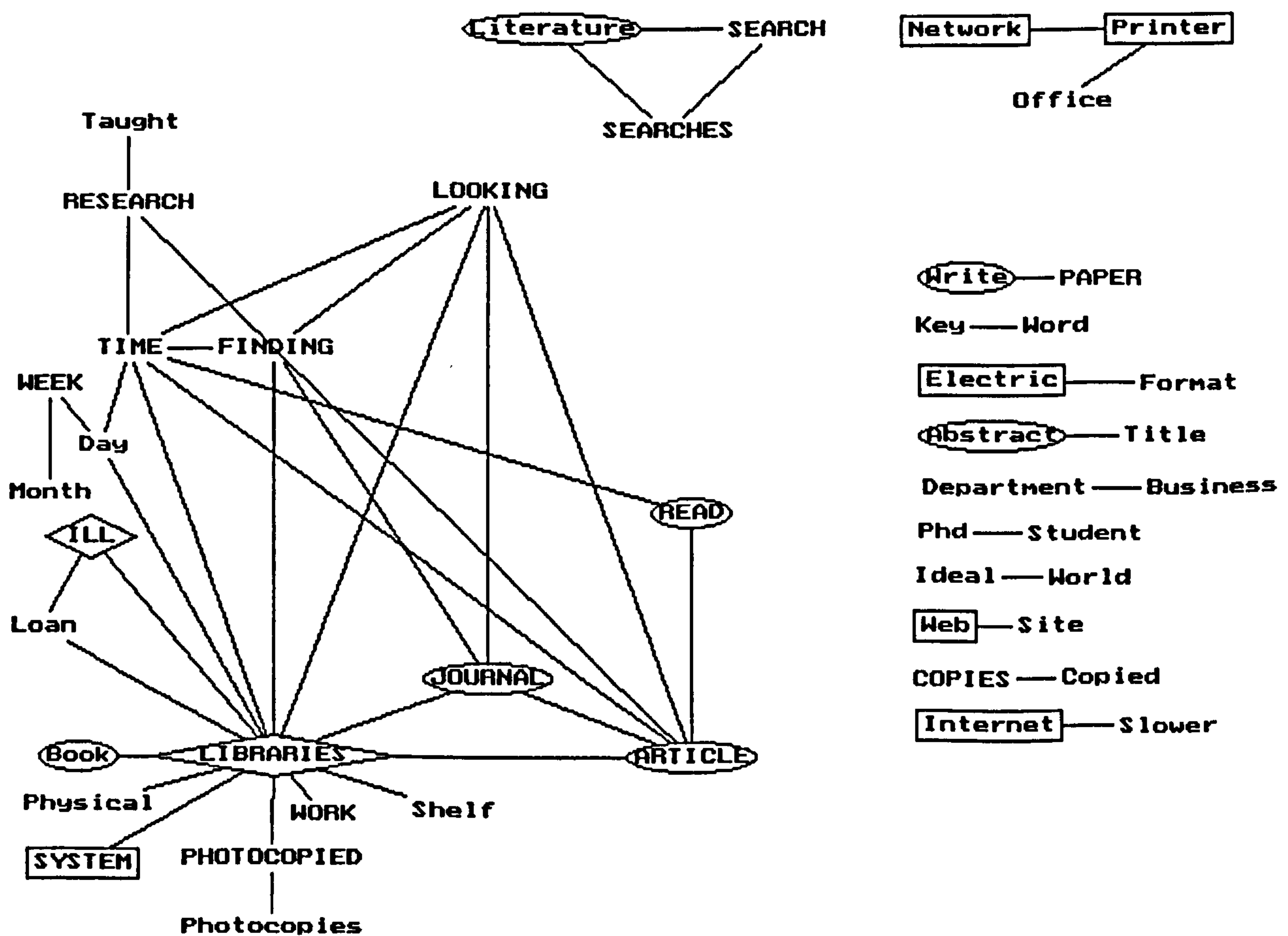


I have tried to lay this diagram out so as to aid comparison with Figure 16, the corresponding diagram relating to the benchmarking interviews as a whole. It is clear that the two are very similar at this threshold level of S . 'Libraries' occupies the central position, and is linked to 'Journal' and 'Finding'. In addition, and in common with the corresponding diagram for the corpus as a whole (Figure 5), 'Libraries' is linked to 'Article' and 'Looking'. The dissociated cluster {Literature-Search-Searches} is

common to Figures 16 and 38, although both {Network-Printer-Office} and {Wait-Week-Day} are present in Figure 16 but absent from Figure 38. Most of the dyads in Figure 38 are familiar from Figure 16, and those that are not - {Ideal-World}, {Phd-Student} - are clearly idiomatic. Scholarly communication category words are again central to Figure 38, information chain words are limited to 'ILL' and 'Libraries', and technology category words are peripheral (the only one being 'Web').

If we increase the detail by decreasing the threshold value, we get Figure 39. Again, I have tried in Figure 39 to maintain the layout of previous global association diagrams, especially Figure 38 so that it is clear how Figure 39 has grown from Figure 38.

Figure 39: The global association network diagram from the benchmarking interviews with business researchers (2)
(threshold S = 0.06)



At this threshold level of the association index, $S=0.06$, the diagram shows the continuing central position of 'Libraries'. 'Journal' has not gained many links compared with Figure 38, but 'Time' has become, with 'Article' second only to 'Libraries'. Of the dissociated clusters and dyads from Figure 38, only 'ILL-Loan' has become linked into the main network. Comparing Figure 39 with the diagram for benchmarking interviews as a whole (Figure 17), it is apparent that the two are very similar. This is especially true when focusing only on scholarly communication, information chain and technology category words. We can propose on this evidence, then, that business researchers were fairly typical in their benchmarking interviews. However, for another view, an inclusion network diagram was generated.

Figure 40: The global inclusion network diagram from the benchmarking interviews with business researchers (threshold I = 0.4)

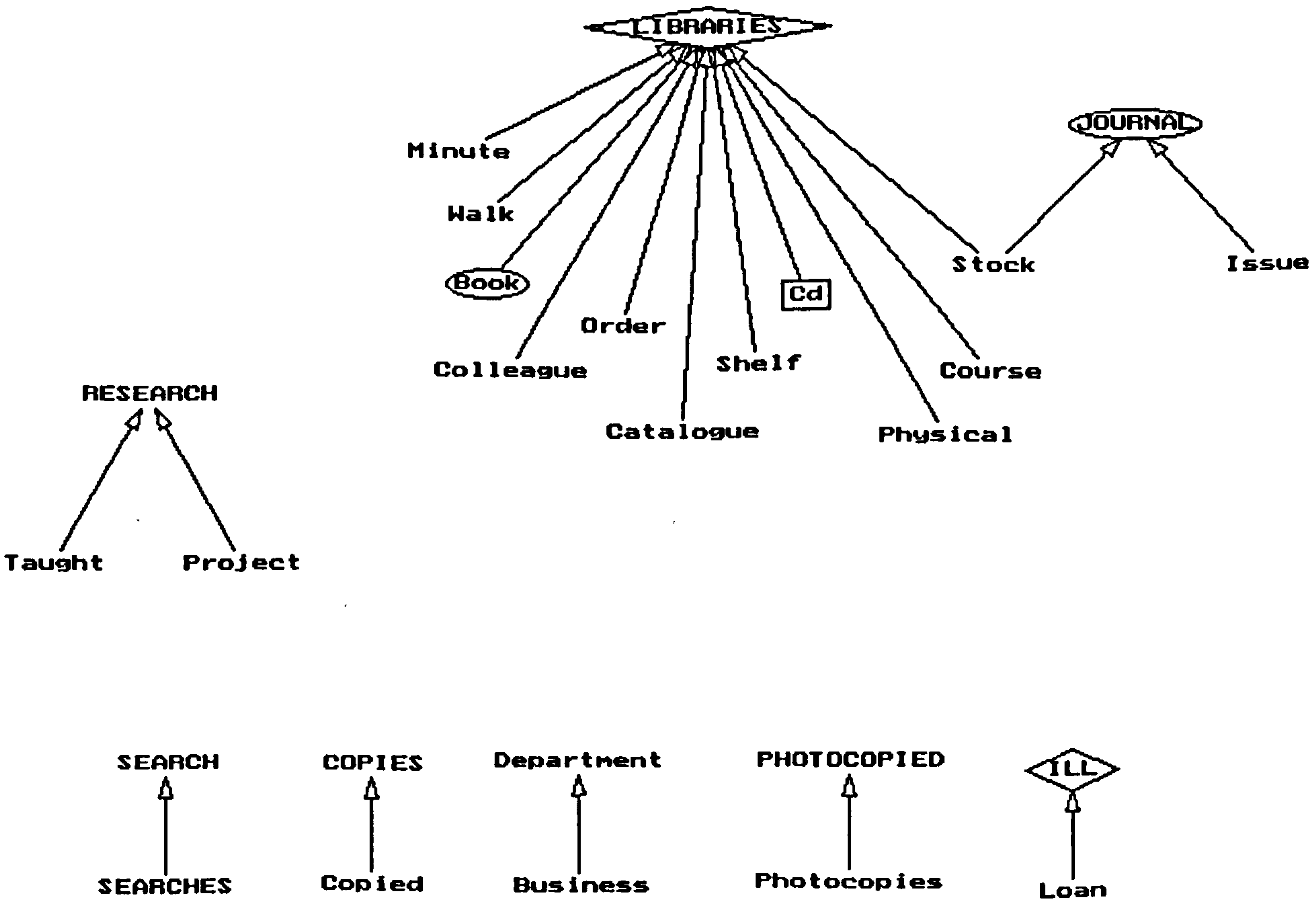


Figure 40 is very similar to Figure 18, the equivalent diagram for the benchmarking interviews as a whole, supporting the proposal above that business researchers were typical in their benchmarking interviews. Figure 40 confirms the central position of 'Libraries' in the actor-network in the corpus. Again, many of the dyads from the association diagrams are shown to be highly hierarchical. Words from the scholarly communication, information chain and technology categories are infrequent in Figure 40.

It is difficult to infer much more from the global network diagrams for the evaluation interview corpus. Again, a finer-grained analysis was possible using the leximappe procedure, and the results of this are discussed below.

Leximappes

Figure 41: Business interviews; benchmarking corpus - Leximappe A

Seed pair {Copies-Copied} S = 0.67

Minimum S for internal links = 0.037 Minimum S for external links = 0.050

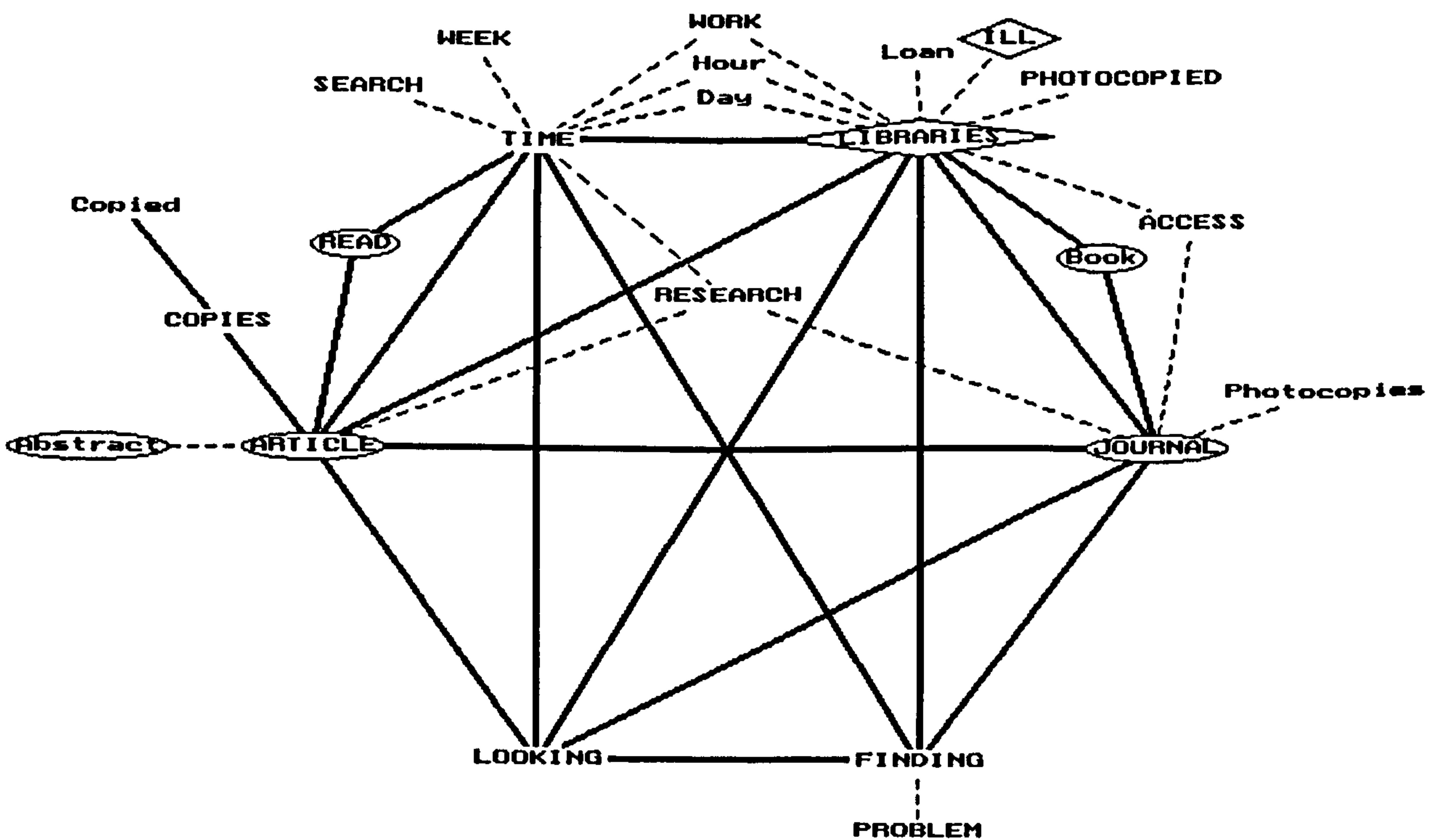


Figure 42: Business interviews; benchmarking corpus - Leximappe B

Seed pair {Search-Searches} $S = 0.66$

Minimum S for internal links = 0.033 Minimum S for external links = 0.030

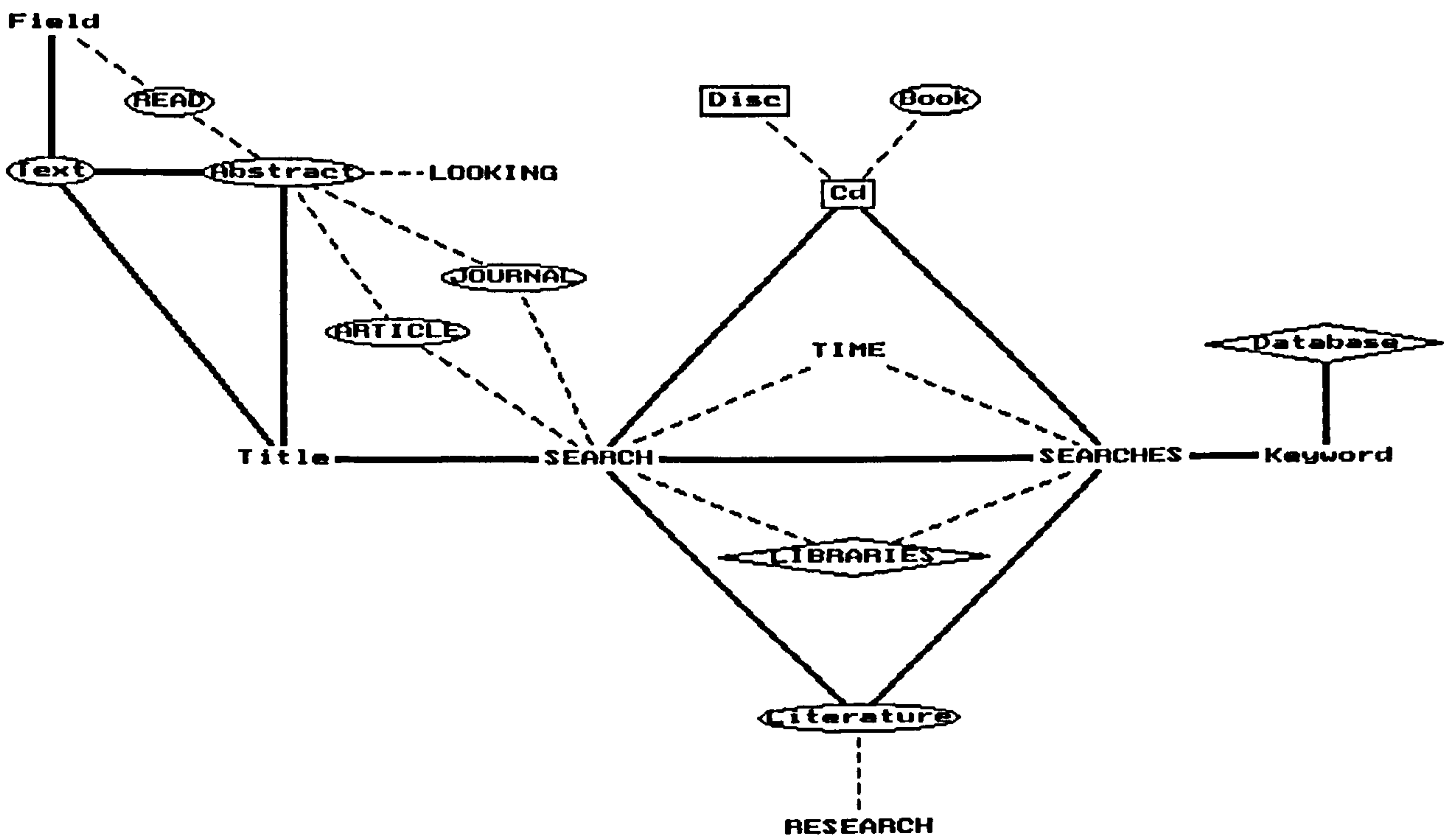


Figure 43: Business interviews; benchmarking corpus - Leximappe C

Seed pair {Photocopies-Photocopied} $S = 0.58$

Minimum S for internal links = 0.040 Minimum S for external links = 0.025

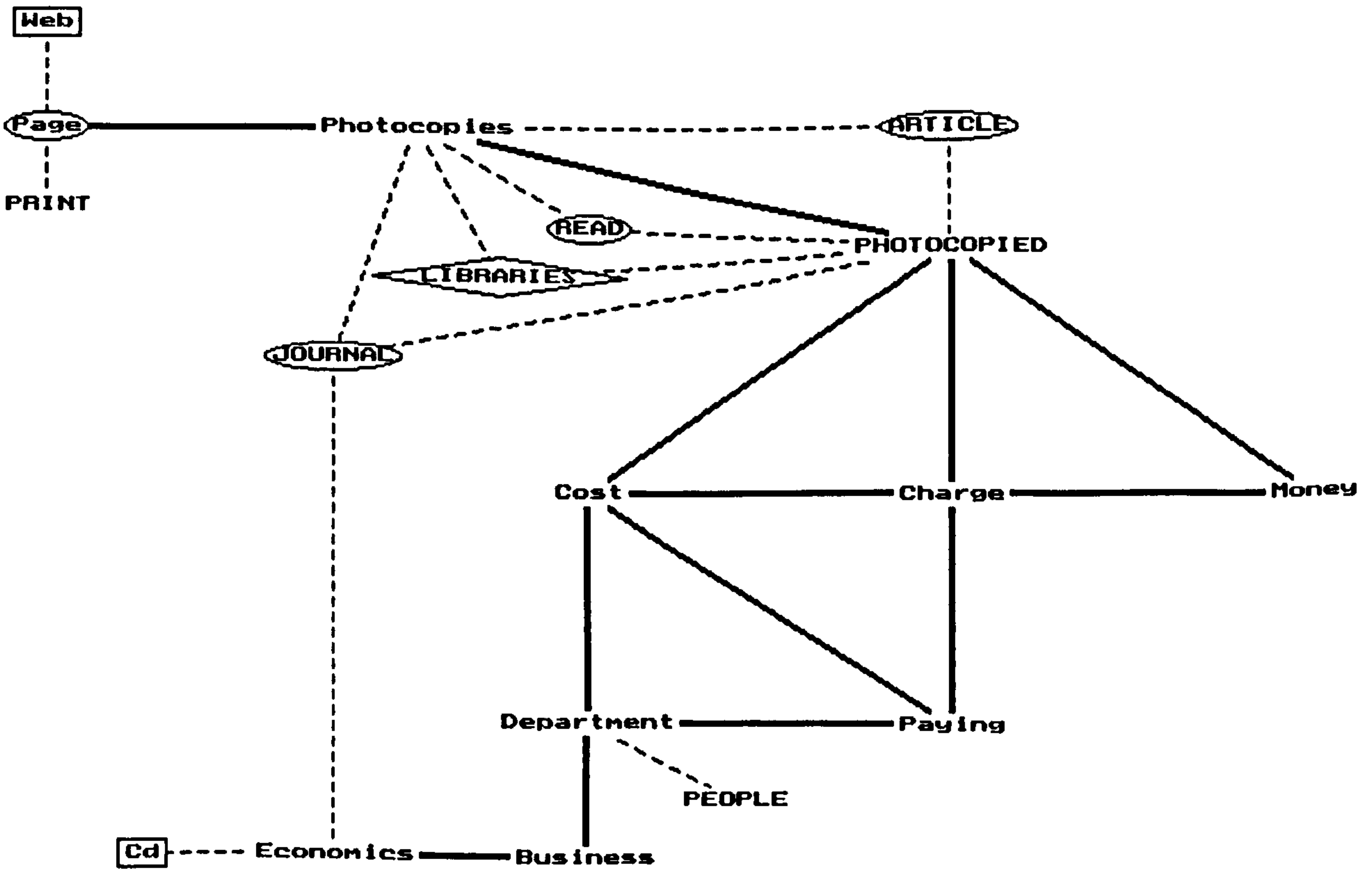


Figure 44: Business interviews; benchmarking corpus - Leximappe D

Seed pair {ILL-Loan} S = 0.30

Minimum S for internal links = 0.030 Minimum S for external links = 0.025

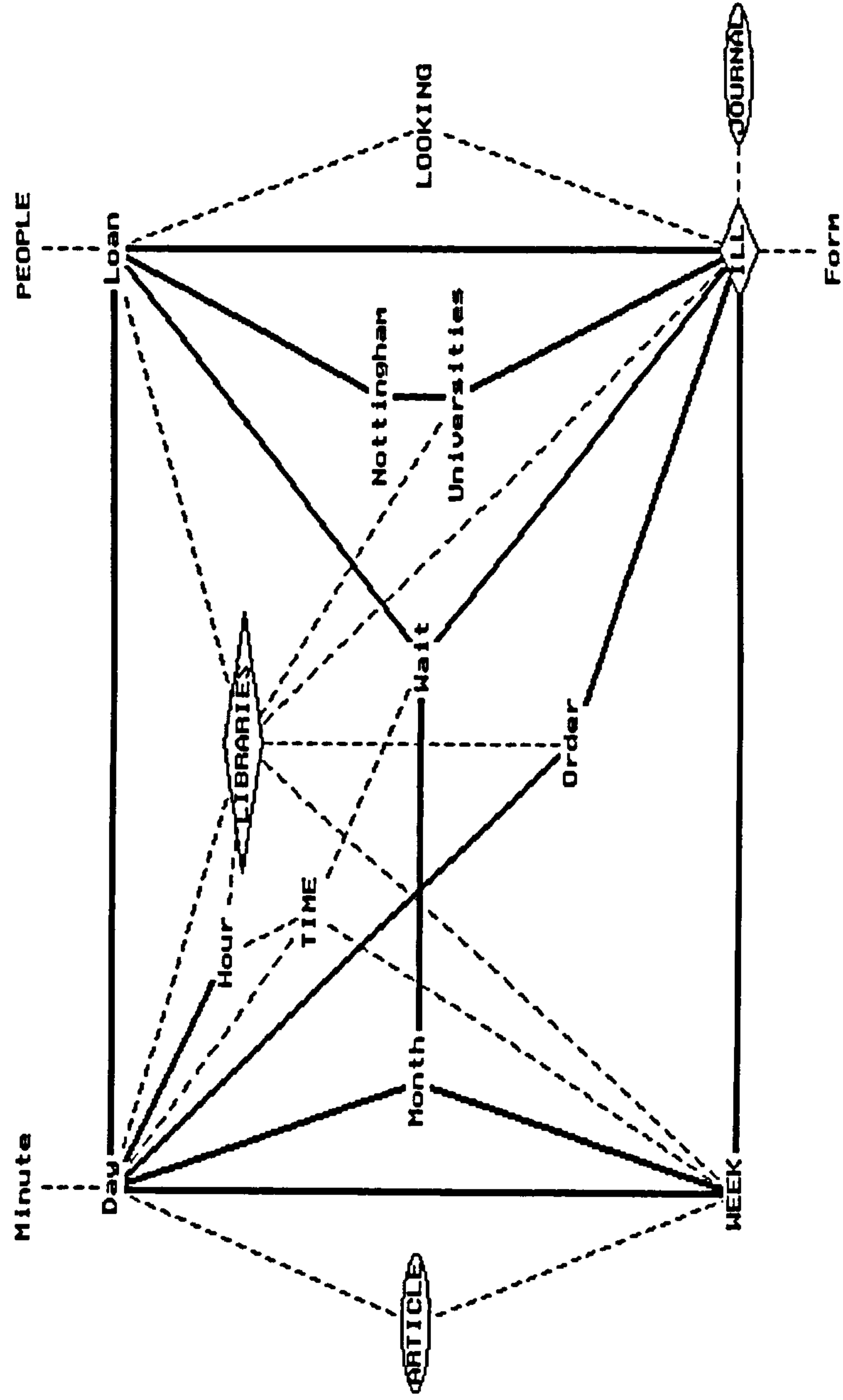


Figure 45: Business interviews; benchmarking corpus - Leximappe E

Seed pair {Web-Site} S = 0.162

Minimum S for internal links = 0.035 Minimum S for external links = 0.030

Format ----- File ----- PRINT

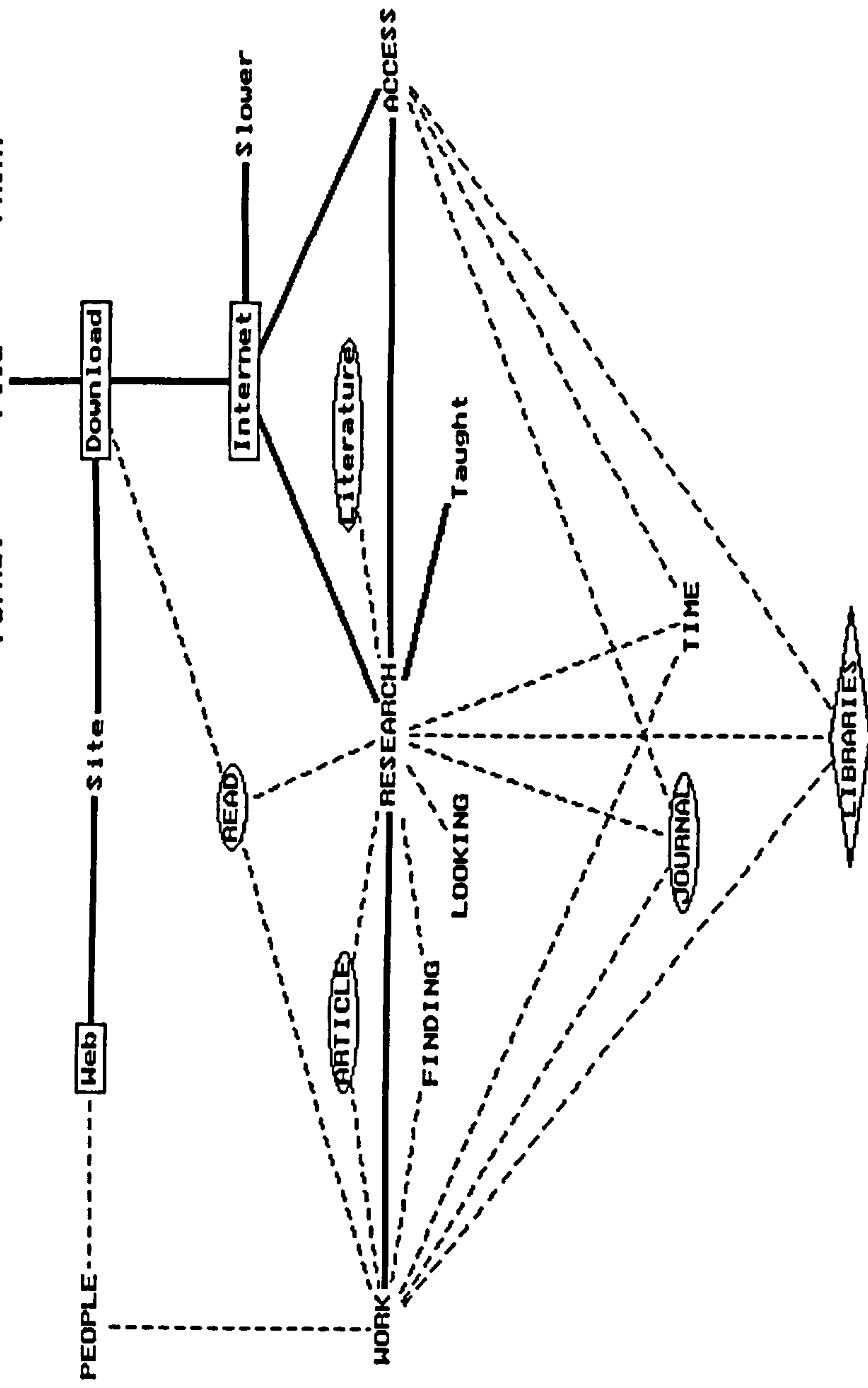


Figure 46: Business interviews; benchmarking corpus - Leximappe F

Seed pair {Ideal-World} S = 0.12

Minimum S for internal links = 0.028 Minimum S for external links = 0.030

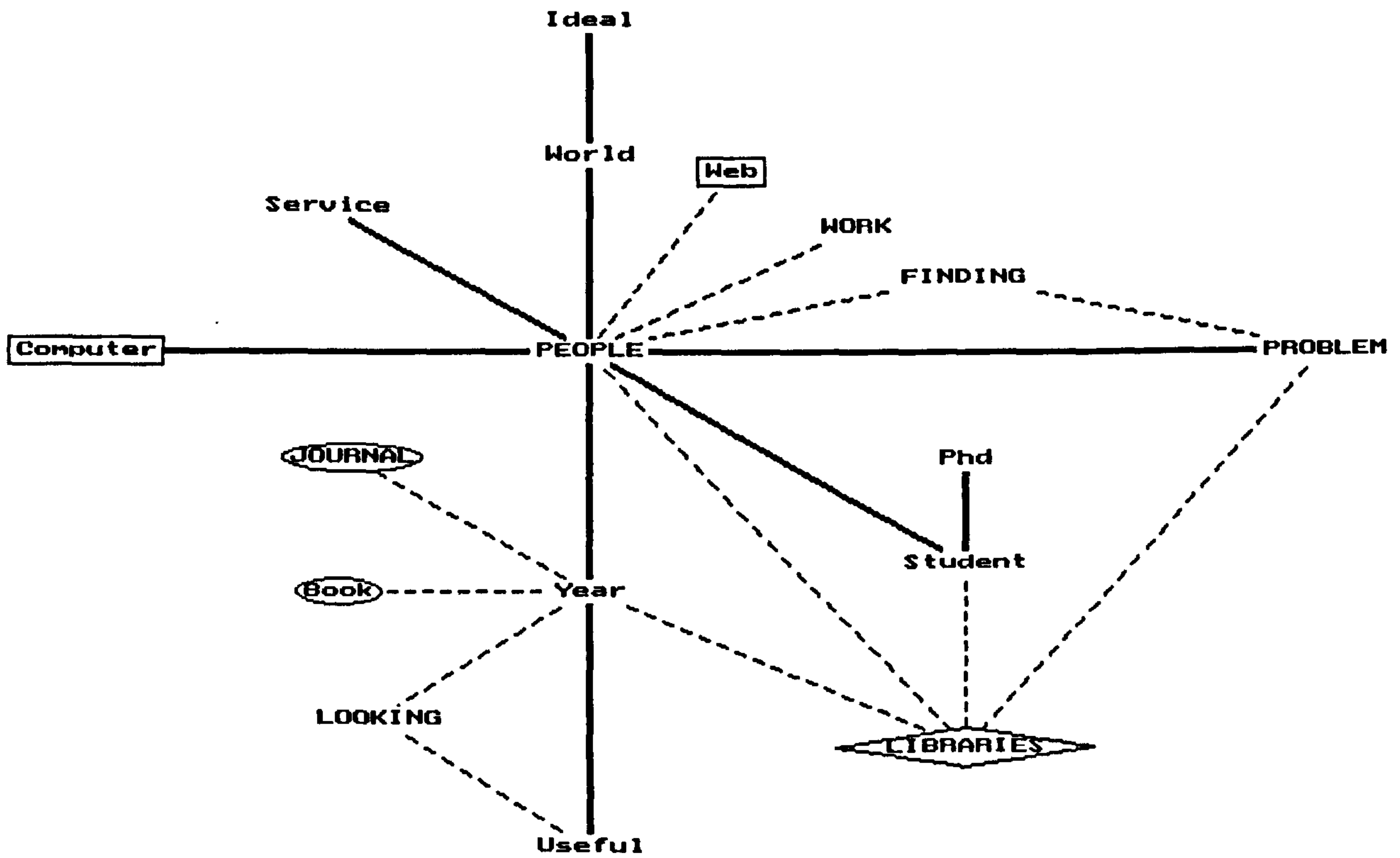
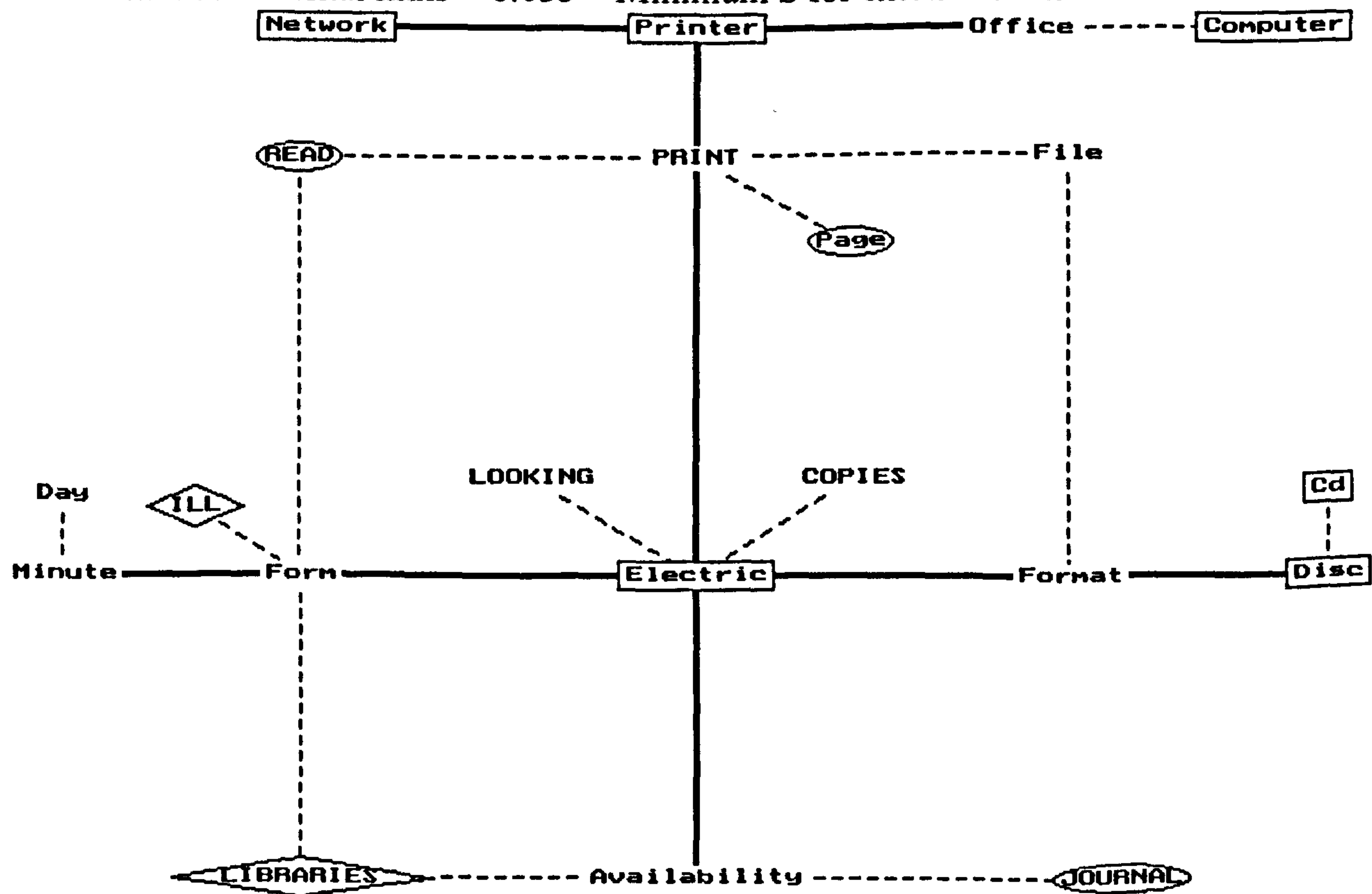


Figure 47: Business interviews; benchmarking corpus - Leximappe G

Seed pair {Printer-Office} S = 0.079

Minimum S for internal links = 0.033 Minimum S for external links = 0.025

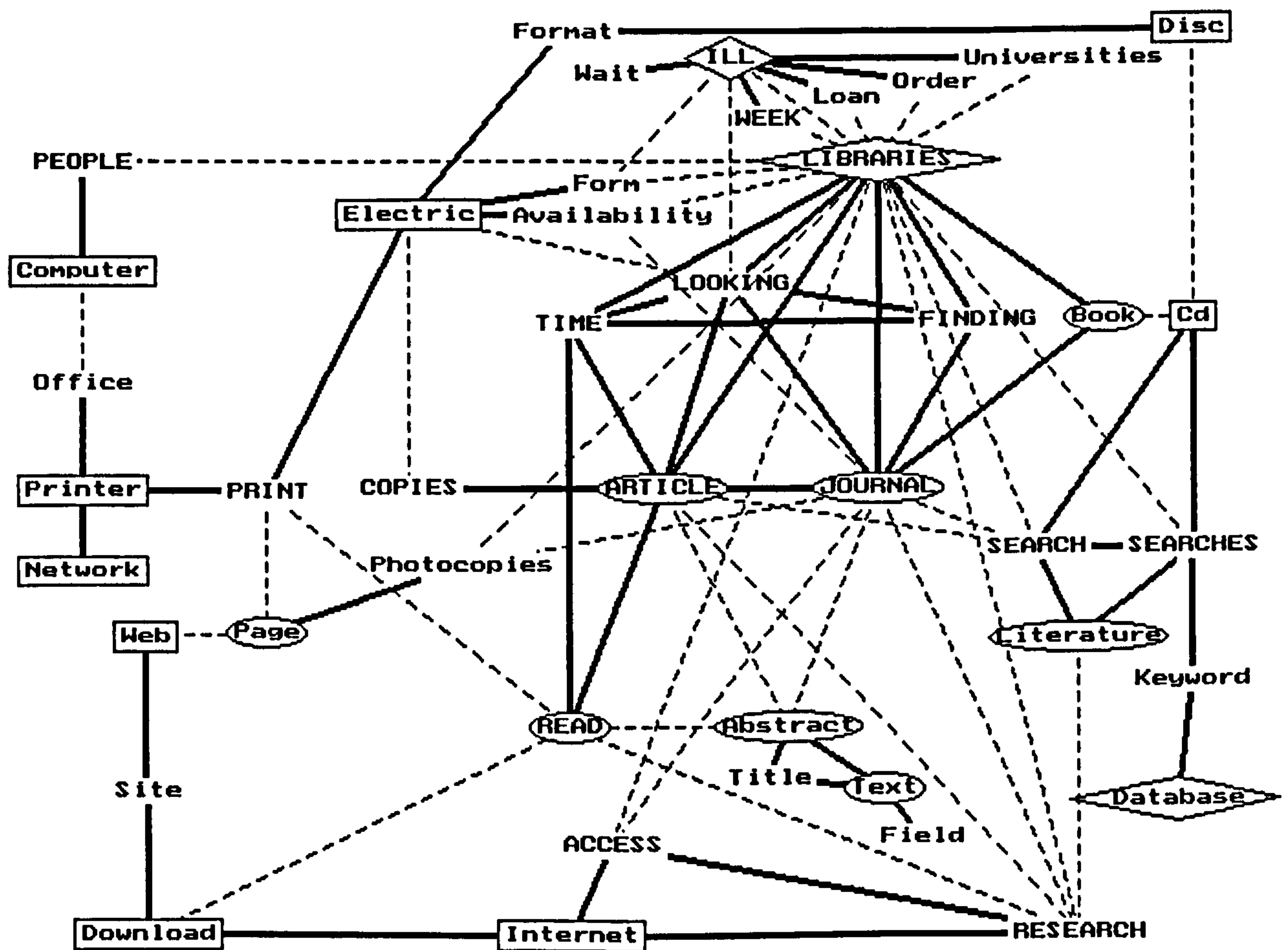


Comparing these leximappes to the global network diagrams shown in Figures 38-40, we can see that Leximappe A (Figure 41) includes all the words in the main network of Figure 38, and so can be considered to be the centre of the semantic space of the business benchmarking interviews. Scholarly communication words are, thus, confirmed as central, most notably 'Journal', 'Article', 'Read' and 'Book', as well as the information chain word 'Libraries'. Leximappe B (Figure 42) expands on the dissociated cluster {Literature-Search-Searches} from the global association networks in Figures 38 and 39. It also includes {Abstract-Text}, further emphasising the centrality of scholarly communication words. However, both the information chain word 'Database' and the technology word 'Cd' are also present. Leximappe C (Figure 43) works from the dyad {Photocopies-Photocopied} in Figure 38, and seems concerned with financial matters {Cost-Charge-Money}, linking them with the department in which the researcher works {Department-Business}. Leximappe D (Figure 44) links {ILL-Loan} from Figure 38 with temporal matters {Week-Day-Hour}, 'Libraries' being an important external node. At Leximappe E (Figure 45), there is the first cluster of technology words {Web-Download-Internet}. Leximappe F is focused on 'People', which is clearly a word with many associations, including evaluative ('Useful', 'Problem') and technological ('Computer') ones. Finally, Leximappe G brings together the second cluster of technology words, linking the dyad {Electric-Format} with the dissociated cluster {Network-Office-Printer} from the global network diagram in Figure 39.

Synthesis

It would appear from a brief review of the leximappes for the business interviews that scholarly communication is a more discrete category than technology, which is split across two leximappes (Figures 45 and 47), and the information chain, which is fragmented. To investigate this, a synthesis diagram was constructed to include all the scholarly communication, information chain and technology category words. This is shown in Figure 48.

Figure 48: Business interviews; benchmarking corpus - Synthesis diagram



This complex diagram is not easy to decipher. Nevertheless, certain features are apparent. Scholarly communication words are tightly focused in the centre of the diagram, whereas technology words are distributed around the edge and information chain words are split between {ILL-Libraries} and 'Database'. Again, this is not an accident of layout but has occurred because of the inter-linking within and between the three sets of category words. The technology words do not fall simply into two discrete groups, as the review of the individual leximappes suggested. However, it is clear that {Network-Printer-Computer} as a cluster is more distanced from the scholarly communication centre than {Web-Download-Internet}. The grouping {Electric-Format-Disc-Cd} is also closer to the centre than {Network-Printer-Computer}. The boundary regions between these two categories in Figure 48 are similar to those in the diagram representing benchmarking interviews in all subject areas (Figure 26). 'Photocopies' and

'Print' are common to both, as is {Web-Page}. The only difference is that {Screen-Read} does not appear in Figure 48, whereas {Cd-Book} does.

Although the {ILL-Libraries} information chain cluster appears in both Figures 26 and 48, its context is different in each. The business benchmarking interviews have the cluster much more discrete, linked not only directly, but also via 'Universities' and 'Week'. The absence of the technology word 'System' leaves 'ILL' otherwise somewhat more isolated. 'Database' is also more isolated in Figure 48 than in Figure 26. We might conclude that the boundary region between the information chain words and those of the other two categories is even more centred on 'Library' than is typical in the benchmarking interviews as a whole.

In summary, although the business benchmarking interviews seem fairly typical of the benchmarking interviews as a whole in terms of the three categories of words, scholarly communication, the information chain and technology, particular differences are apparent.

5. Evaluation interviews with business researchers

This section is concerned with the evaluation interviews with researchers in academic departments focusing on business. This corpus amounted to 33 interviews in total.

As above, the results are given in the following order:

- Graphical estimation of the core words used most frequently;
- Global network showing the overall distribution of the words in the interviews according to the S (association) and the I (inclusion) indexes;
- Leximappes for the business evaluation interviews;
- Synthesis of leximappes to show ‘scholarly communication’, ‘information chain’ and ‘technology’ networks in relation to each other.

Graphical estimation of the core

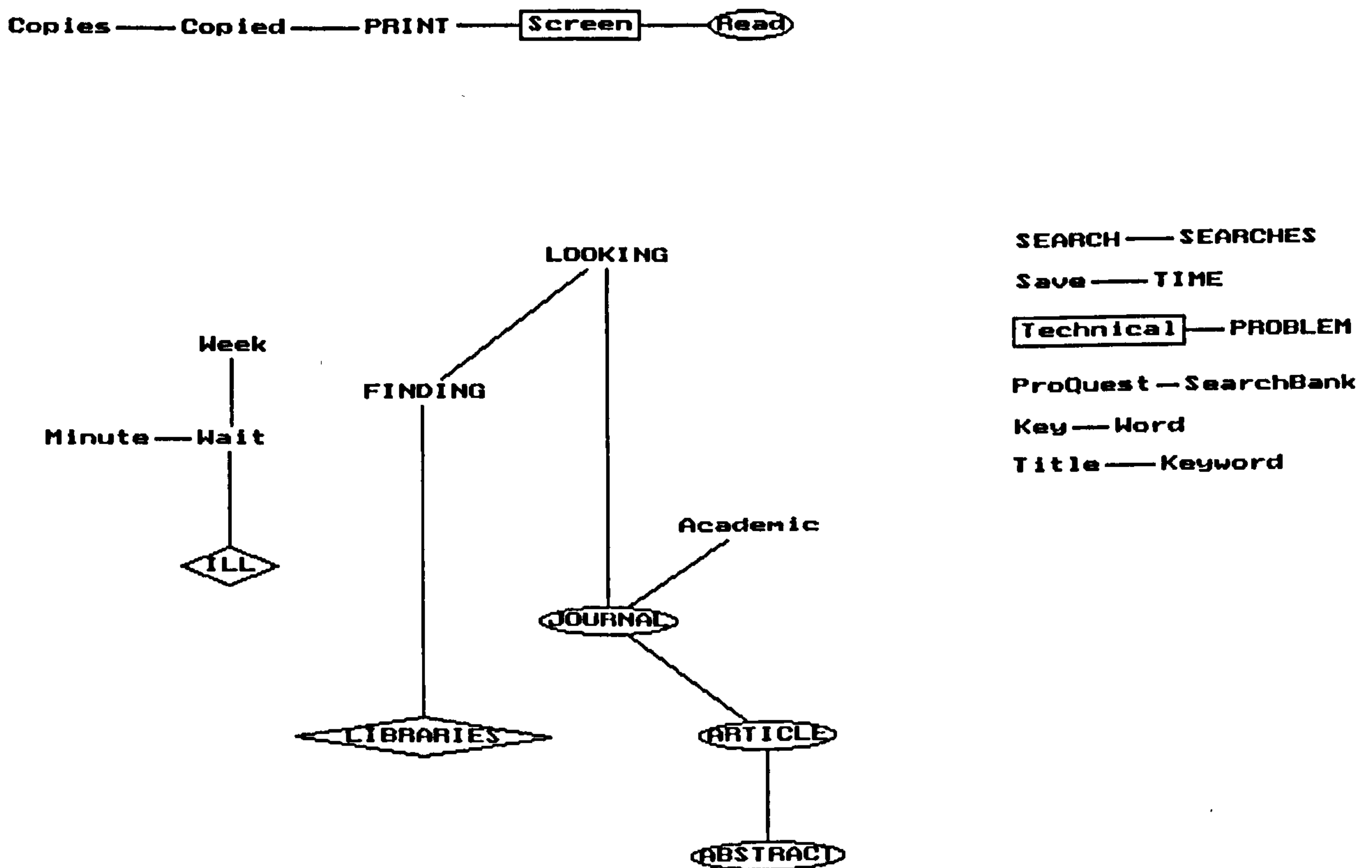
The core of words for the business evaluation corpus was estimated graphically from the Bradford-like distribution of the prompt words. The non-linear section of the graph included all words ranking above Log 3.1, which gave a core of words as follows:

ARTICLE, TIME, JOURNAL, SEARCH, SEARCHES, LOOKING, FINDING, LIBRARIES, PROBLEM, TEXT, WORK, ACCESS, ABSTRACT, RESEARCH, USEFUL, PRINT.

Global network diagrams

The global association network diagram for the evaluation interviews with business researchers, is shown at two threshold values of the association index in Figures 49 and 50.

Figure 49: The global association network diagram from the evaluation interviews with business researchers (1)
 (threshold S = 0.07)

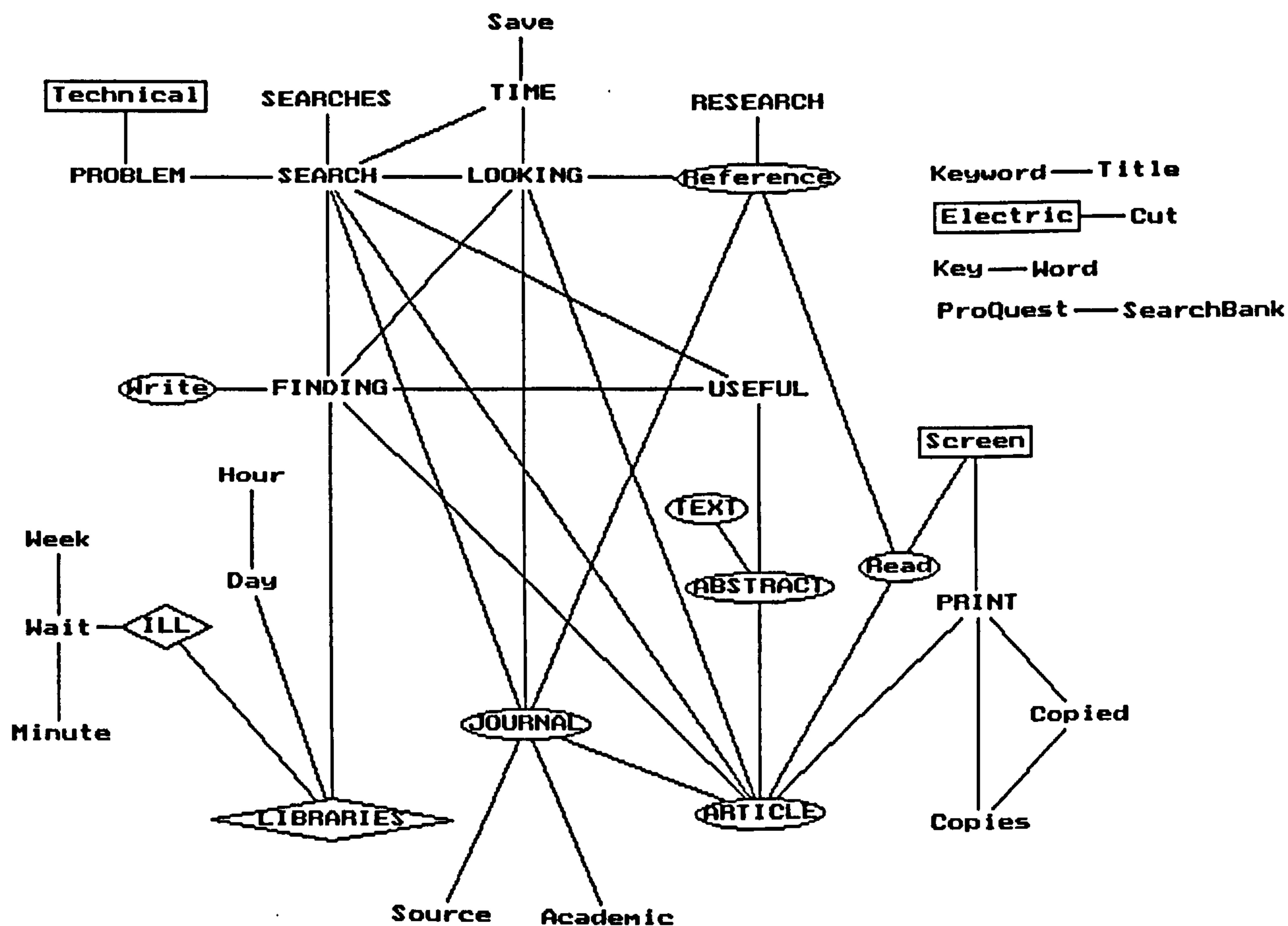


Once again, this diagram is arranged to aid comparison with previous ones, especially Figure 38 (the benchmarking interviews with business researchers) and Figure 27 (the evaluation interviews across all three subject areas). There are major similarities with both. Comparing Figure 49 with Figure 38, we can see that the major network consists of {Libraries-Finding-Looking-Journal-Article}. However, unlike the benchmarking interviews, the evaluation interviews also give rise to two smaller networks, {Wait-Week-ILL-Minute} and {Copies-Copied-Print-Screen-Read}. We can understand this, perhaps, in terms of the difference between the benchmarking and the evaluation interviews. The former were designed to allow researchers to discuss their current practices, whereas the latter were designed for them to discuss features of electronic systems (hence {Print-Screen-Read}) and to compare these with other systems (hence {ILL-Wait}). The difference between the identified dyads is also revealing, since {Photocopied-Photocopies}, {Department-Business} and {Ideal-World} have been

replaced by {ProQuest-SearchBank}, {Save-Time}, {Title-Keyword} and {Technical-Problem}. The latter set is clearly more concerned with electronic document access than the former, which is unsurprising. The presence of both {Key-Word} and 'Keyword' strongly suggests that this idiomatic expression was inconsistently transcribed from the interview tapes. Even though the evaluation interviews with business researchers are clearly different to the benchmarking interviews, scholarly communication words still take up the central positions in the network, along with the information chain words 'ILL' and 'Libraries', with technology words relegated to the margins.

If we increase the detail by decreasing the threshold value, we get Figure 50. Again, I have tried in Figure 50 to maintain the layout of previous global association diagrams, especially Figure 49 so that it is clear how Figure 50 has grown from Figure 49.

Figure 50: The global association network diagram from the evaluation interviews with business researchers (2)
(threshold $S = 0.055$)



At this threshold level of the association index, $S=0.055$, the diagram has become somewhat confusing. However, some features are apparent. Firstly, unlike Figure 39 (the equivalent diagram for the benchmarking interviews with business researchers), 'Libraries' is not central. Indeed, this is also unlike the equivalent diagram for evaluation interviews across all three subject areas (Figure 28), although here the contrast is not so striking. Hence, we can conclude that 'Libraries' was less central in the evaluation than in the benchmarking interviews, and that this trend was exaggerated in the evaluation interviews with business researchers. There is no obvious centre to Figure 50, although the cluster of scholarly communication words {Journal-Article-Abstract} is important, as is a region around {Search-Finding-Looking}. The two minor networks from Figure 49 have been incorporated into the main network, {ILL-Wait} at 'Libraries' and {Print-

Screen-Read} at 'Article'. We can conclude, then, that business researchers were fairly typical in shifting away from 'Libraries' and toward scholarly communication words in the evaluation interviews. However, for another view, an inclusion network diagram was generated.

Figure 51: The global inclusion network diagram from the evaluation interviews with business researchers
(threshold I = 0.55)

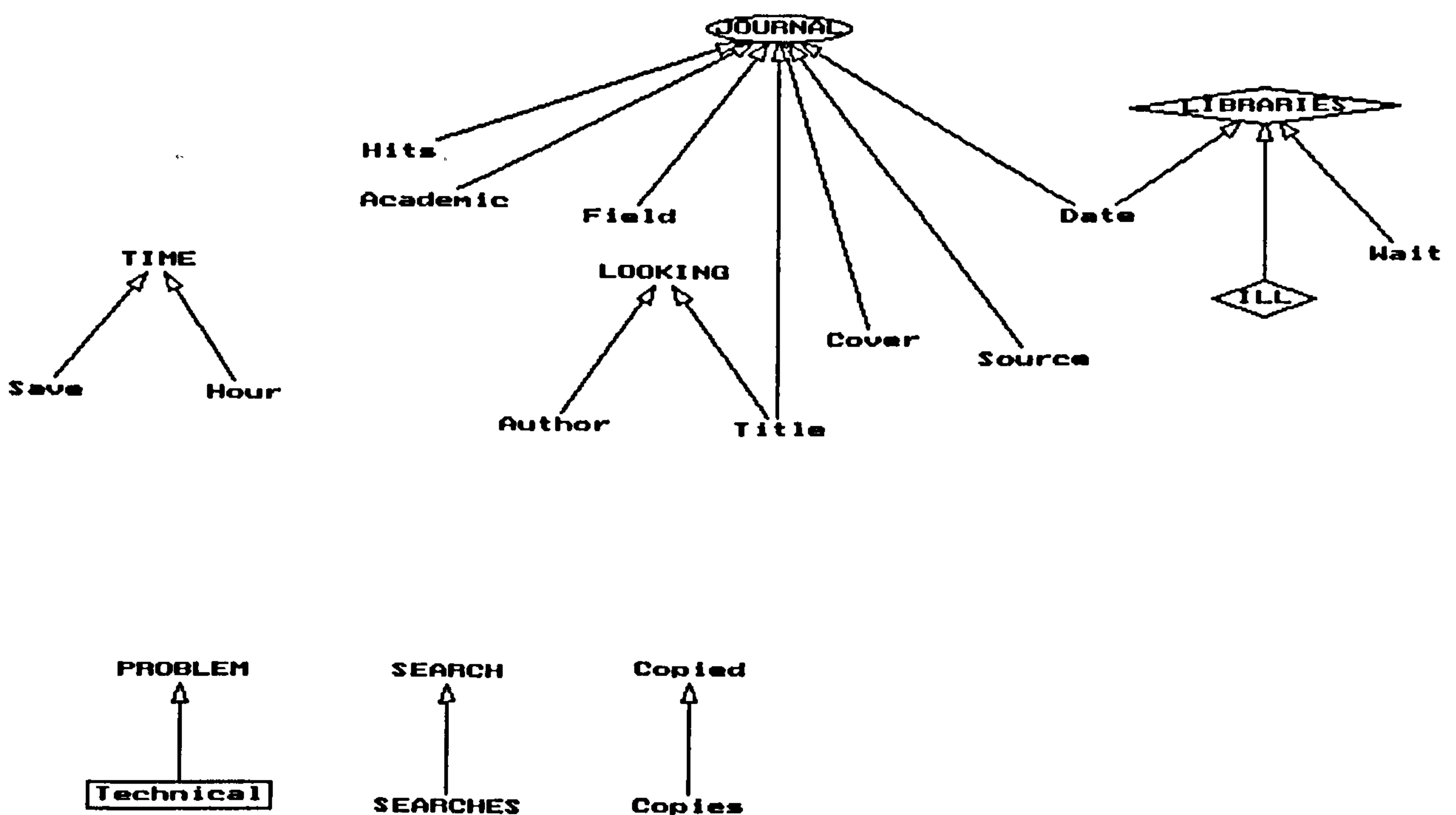


Figure 51 is similar to Figure 29, the equivalent diagram for the evaluation interviews as a whole, supporting the proposal above that business researchers were typical in their evaluation interviews. Comparing it with Figure 40 (the equivalent diagram for the benchmarking interviews with business researchers), we can see a shift - exaggerated when compared with Figure 29 - from 'Libraries' to 'Journal' as the main pole of the inclusion diagram. This supports the observations above relating to the association diagrams, that those representing the evaluation interviews showed a shift away from 'Libraries' and toward scholarly communication words. Again, for a finer level of analysis, leximappes were generated.

Leximappes

Figure 52: Business interviews; evaluation corpus - Leximappe A

Seed pair {Copies-Copied} $S = 0.84$

Minimum S for internal links = 0.056 Minimum S for external links = 0.050

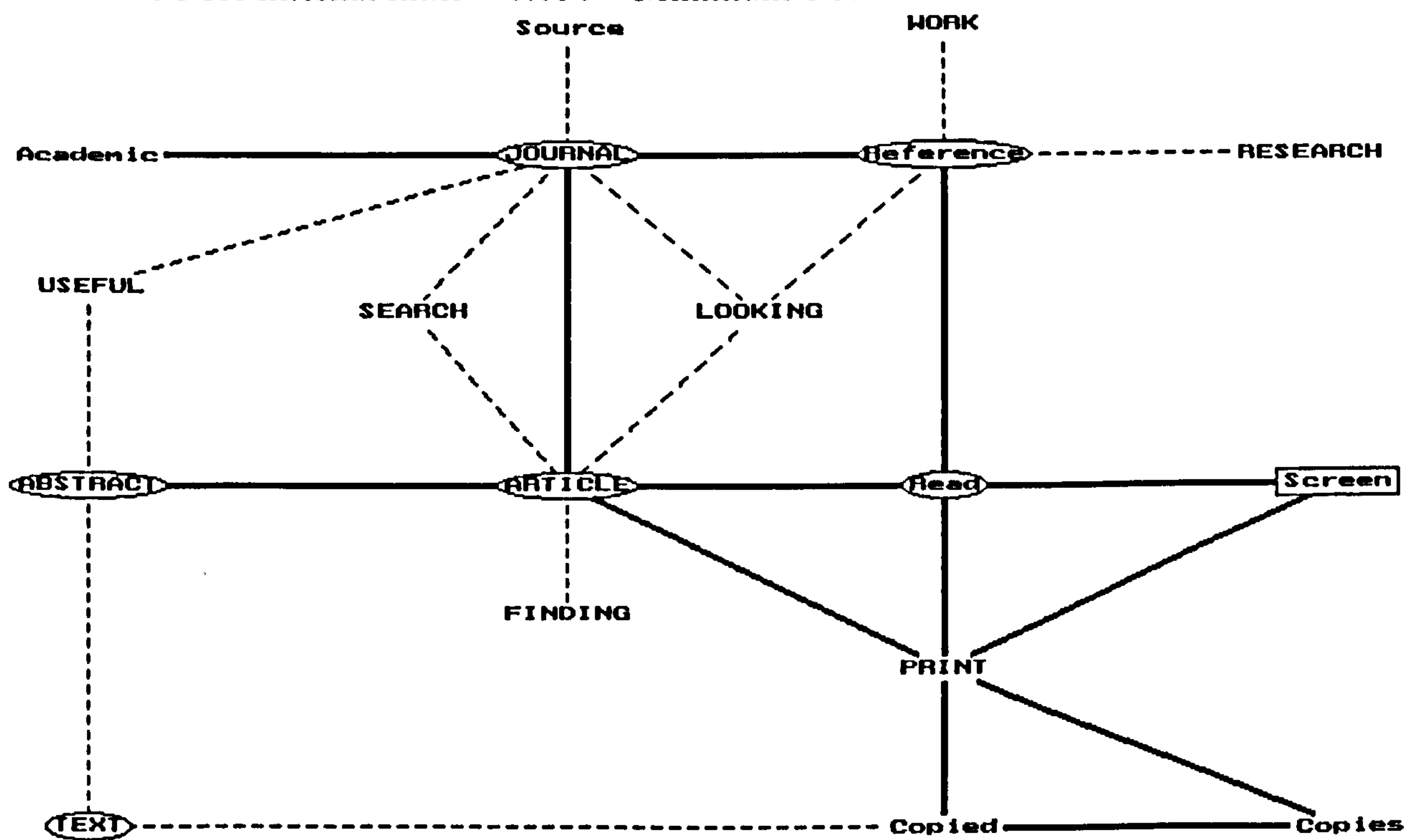


Figure 53: Business interviews; evaluation corpus - Leximappe B

Seed pair {Searches-Search} S = 0.65

Minimum S for internal links = 0.060 Minimum S for external links = 0.050

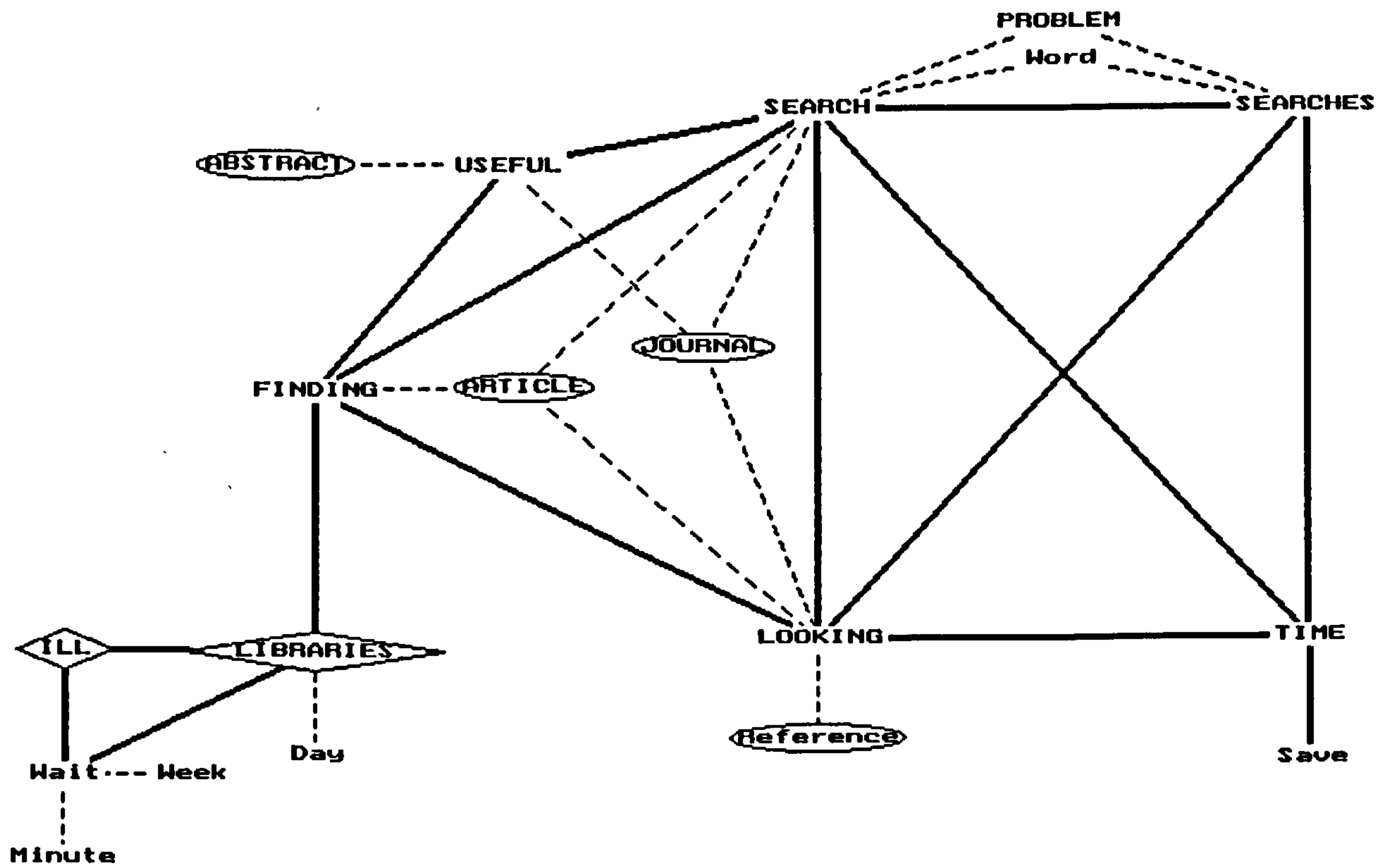


Figure 54: Business interviews; evaluation corpus - Leximappe C

Seed pair {Key-Word} S = 0.14

Minimum S for internal links = 0.025 Minimum S for external links = 0.030

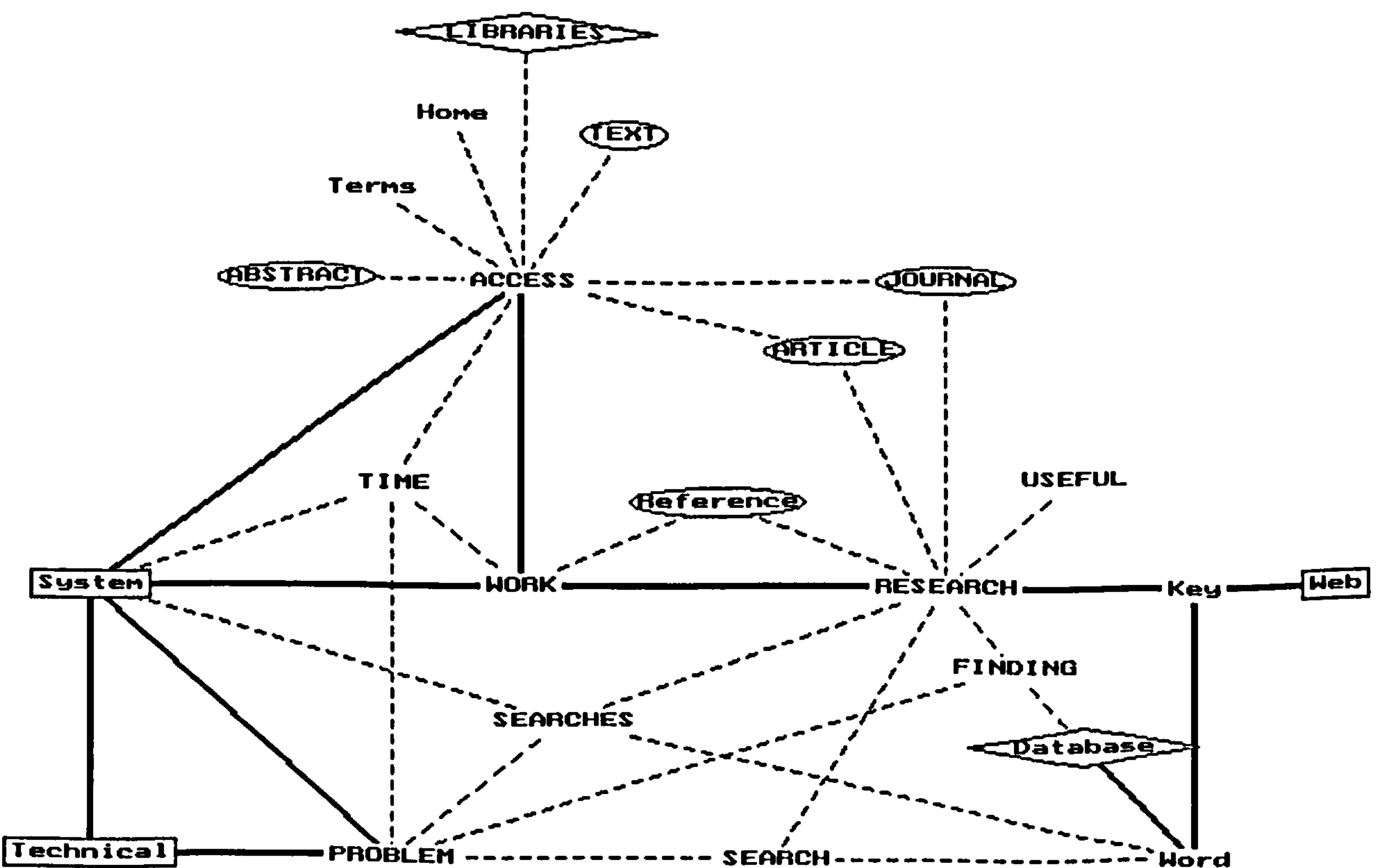


Figure 55: Business interviews; evaluation corpus - Leximappe D

Seed pair {ProQuest-SearchBank} S = 0.11

Minimum S for internal links = 0.024 Minimum S for external links = 0.025

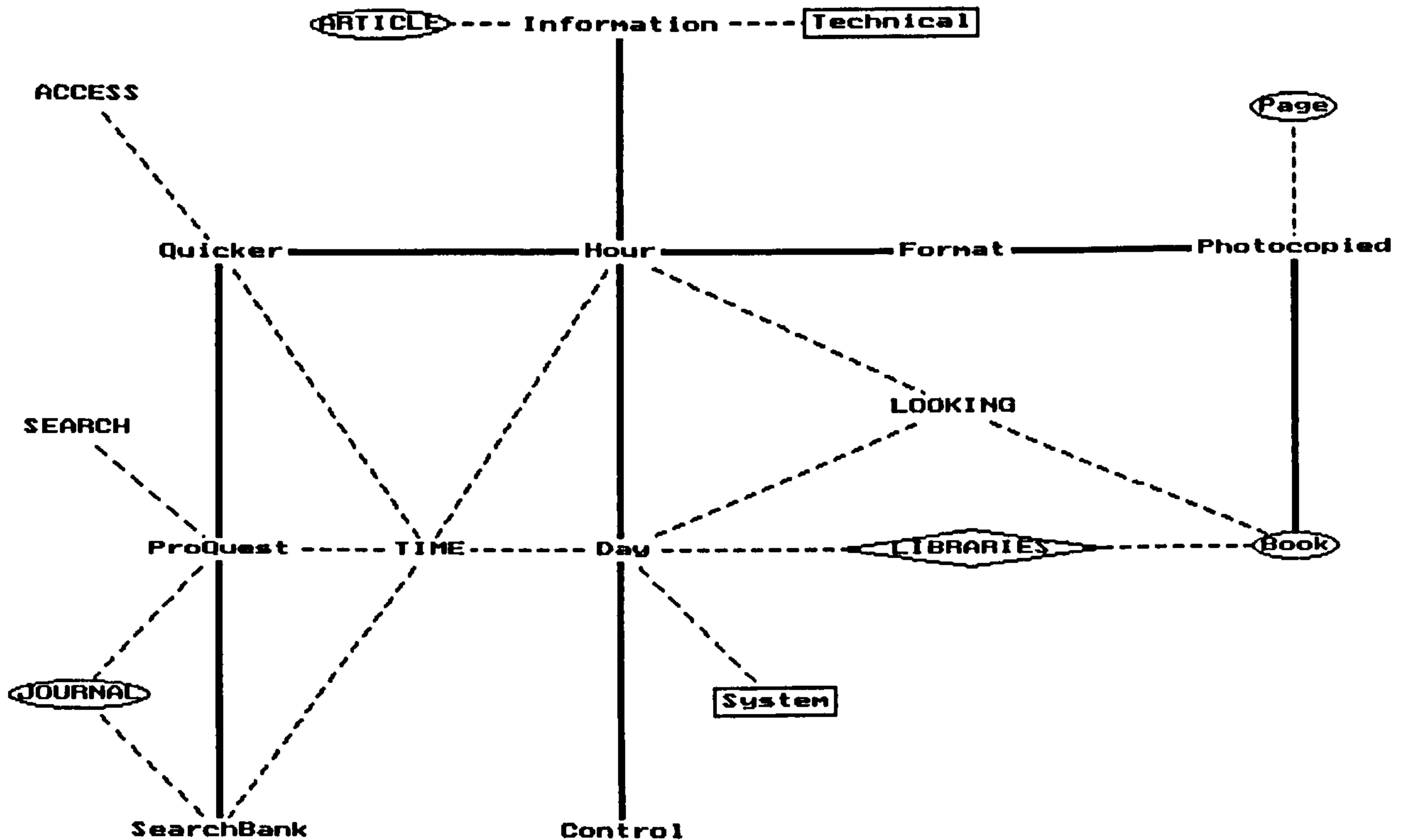
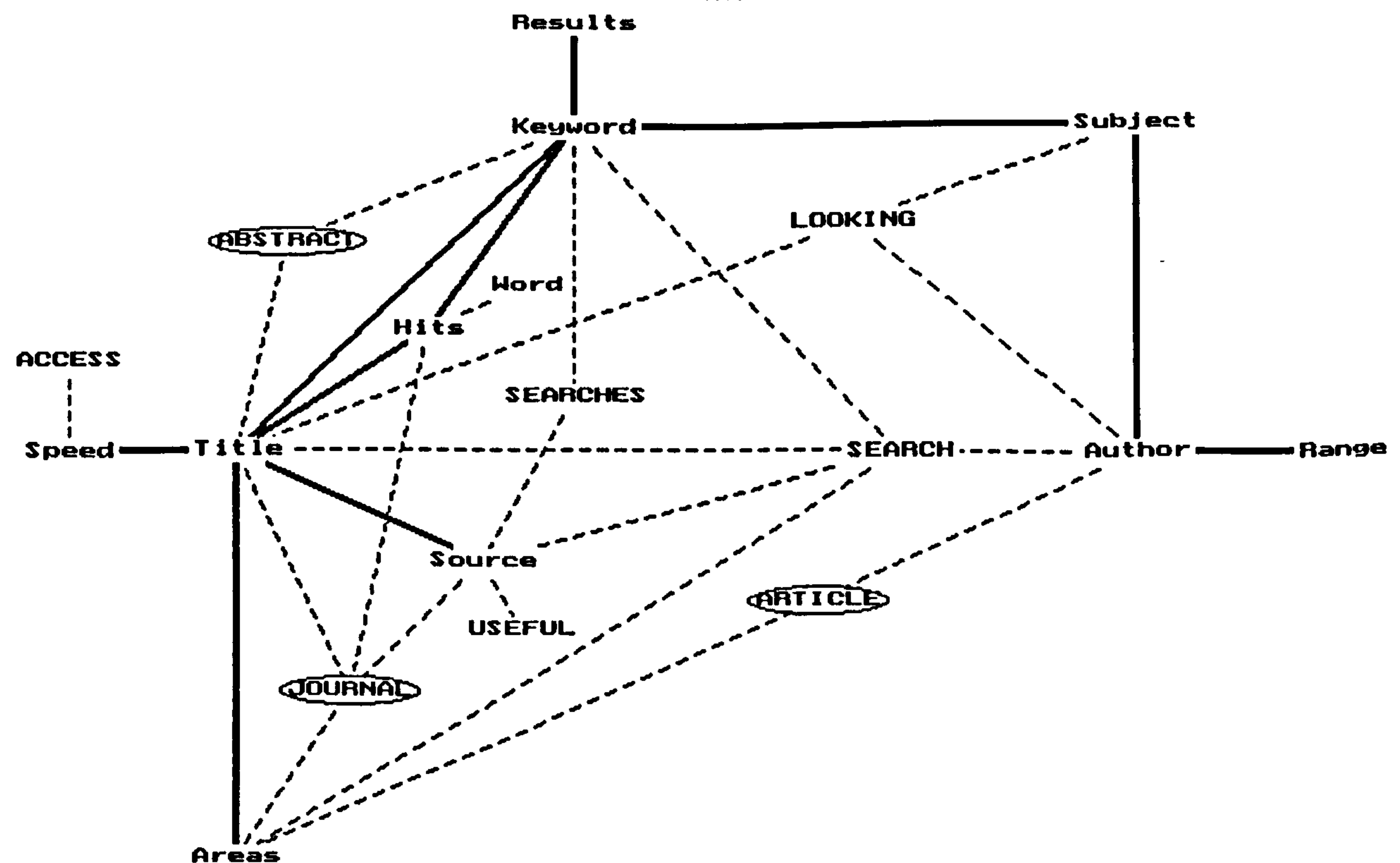


Figure 56: Business interviews; evaluation corpus - Leximappe E

Seed pair {Title-Keyword} S = 0.093

Minimum S for internal links = 0.017 Minimum S for external links = 0.020



Comparing these leximappes with the global network diagrams (Figures 49 and 50), we can see that business evaluation Leximappe A (Figure 52) links together two of the three networks in Figure 49, centred on 'Journal' and 'Print' respectively, and the linking term, as in Figure 50, is 'Read'. However, the main network in Figure 49 is split between Leximappes A and B (Figures 52 and 53). The left portion of it comprises a part of Leximappe B, and links the {ILL-Wait} cluster to the {Search-Searches} dyad. The linking term here is 'Libraries'. Leximappe C (Figure 54) is not derivable from the global network diagram; it suggests links between 'Research', {Key-Word} and {Technical-Problem} from Figure 50. The remaining leximappes except Leximappe G are based around dyads from Figure 50. Scholarly communication words appear centrally in Leximappe A {Journal-Article-Reference-Read-Abstract}, but are also in Leximappe D {Photocopied-Book}, Leximappe F {Acrobat-Page-Internet} and Leximappe G {Download-Text}. As these latter examples suggest, technology words are scattered throughout the leximappes, with clusters in Leximappe C {Technical-System} and Leximappe F {Acrobat-Page-Internet}. The familiar information chain dyad {ILL-Libraries} is in Leximappe B. The synthesis diagram shown below (Figure 59) gives a clearer view of the relations within and between the three categories. Comparing this set of leximappes with those for the evaluation interviews as a whole (Figures 30-36), there appear to be major differences between them, despite some common features. Again, these are discussed in relation to the category words as synthesised in Figure 59.

A comparison between the business benchmarking and the business evaluation leximappes repeats the patterns remarked upon above. Firstly, scholarly communication words appear to form a more important and discrete category in the latter and, secondly, the information chain word 'Libraries' seems to be less related to this category. In the business benchmarking leximappes (Figures 41-47), {Journal-Article} appeared in Leximappe A (Figure 41) without either 'Reference' or 'Abstract' (although there was an external link to the latter) and linked strongly to 'Libraries'. In the business evaluation Leximappe A (Figure 52), {Journal-Article} is linked with both {Reference-Read} and 'Abstract', and not to 'Libraries'. 'Libraries' appears in Leximappe B as a linking term between words relating to resource discovery {Finding-Search-Looking} and interlibrary

However, the scholarly communication cluster is, in Figure 59, even more tightly focused than was the case in the equivalent diagram representing the business benchmarking interviews (Figure 48). In contrast, clusters of technology words that were apparent in Figure 48 are not so clearly apparent in Figure 59. The clusters {Internet-Slower-Acrobat} and {Technical-System} are, perhaps, the only combinations of technology words to be characterisable as such. This is the opposite to the finding discussed above relating to the difference between the benchmarking and evaluation interviews across all three subject areas (Figures 26 and 37). There, the category of technology was more discrete in the evaluation interviews than in the benchmarking interviews. Although less discrete in Figure 59, technology words were still largely distanced from scholarly communication words.

Interesting comparisons are possible. For example, in Figure 48 'Computer' was linked with 'People' and 'Office', whereas in Figure 59 it is linked with 'People' and 'Home', suggesting a shift in where researchers talked of using this type of technology. Or take 'Print'; in Figure 48 it was linked with 'Printer' and 'Electric', suggesting a view of 'Print' as embedded mainly in technological practices, whereas in Figure 59 it is linked with 'Screen' and 'Read', suggesting that 'Print' is here much more part of the boundary region between technology and scholarly communication. The specific information formats of 'Book' and 'Web' are both much more dissociated from the centre of Figure 59 than they were in Figure 48, suggesting an increased focus on one particular format, the journal article. Finally, the information chain {ILL-Libraries} dyad is more closely linked to 'Database' than was the case in Figure 48, but the dyad itself is more isolated from the rest of the diagram, suggesting that the definition of the information chain used in this study is less central.

This boundary regions are different in a number of ways to those in Figure 48. That between scholarly communication and technology has only one word in common, 'Print', although, as I have noted, its connections suggest that it is embedded in rather different actor-networks in the two sets of interviews. Other parts of this boundary region include {Screen-Print-Read}, 'Access' and 'Form'. This is similar to the evaluation interviews

as a whole (Figure 37), suggesting that, although the composition of these two categories is different, the relations between them in the business evaluation interviews are fairly typical of the evaluation interviews. The boundary between the information chain and scholarly communication is, apart from 'Book', largely via 'Access' to {Abstract-Article-Text}, which replaces that directly to {Journal-Article} from the business benchmarking interviews. 'Access' would seem, then, to have come between the information chain and scholarly communication in this corpus. The categories of the information chain and technology are so removed from each other in Figure 59 that there is no easily identified boundary region.

In summary, comparing the business benchmarking and the business evaluation interviews shows that while scholarly communication has, with some exceptions, become a more discrete category in the latter, technology has become a less discrete category and the information chain has become a more isolated category. The trend relating to scholarly communication and technology is in contrast to that in the interviews as a whole, and might suggest that business researchers embedded technology relatively more in other actor-networks, making the category less visible as a discrete category in their interview talk. However, the boundary between scholarly communication and technology was typical of that in the evaluation interviews as a whole, and suggested that important talk revolved around the word 'Access' and around printing and / or reading from the screen. 'Access' was also the main link between an otherwise isolated, small information chain category and much of the rest of the interview corpus.

6. Benchmarking interviews with geography researchers

As noted above, the interviews could be divided according to the subject area of the researchers being interviewed and also of the coverage of the document access system being evaluated in the second round of interviews. At this point we are concerned with the interviews with researchers in academic departments focusing on geography. This corpus amounted to 24 interviews in total. Again, the analysis is split into two parts, relating to the benchmarking interviews and to the evaluation interviews. This section is concerned with the benchmarking interviews with geography researchers. There were 17 such interviews.

As above, the results are given in the following order:

- Graphical estimation of the core words used most frequently;
- Global network showing the overall distribution of the words in the interviews according to the S (association) and the I (inclusion) indexes;
- Leximappes for the geography benchmarking interviews;
- Synthesis of leximappes to show ‘scholarly communication’, ‘information chain’ and ‘technology’ networks in relation to each other.

Graphical estimation of the core

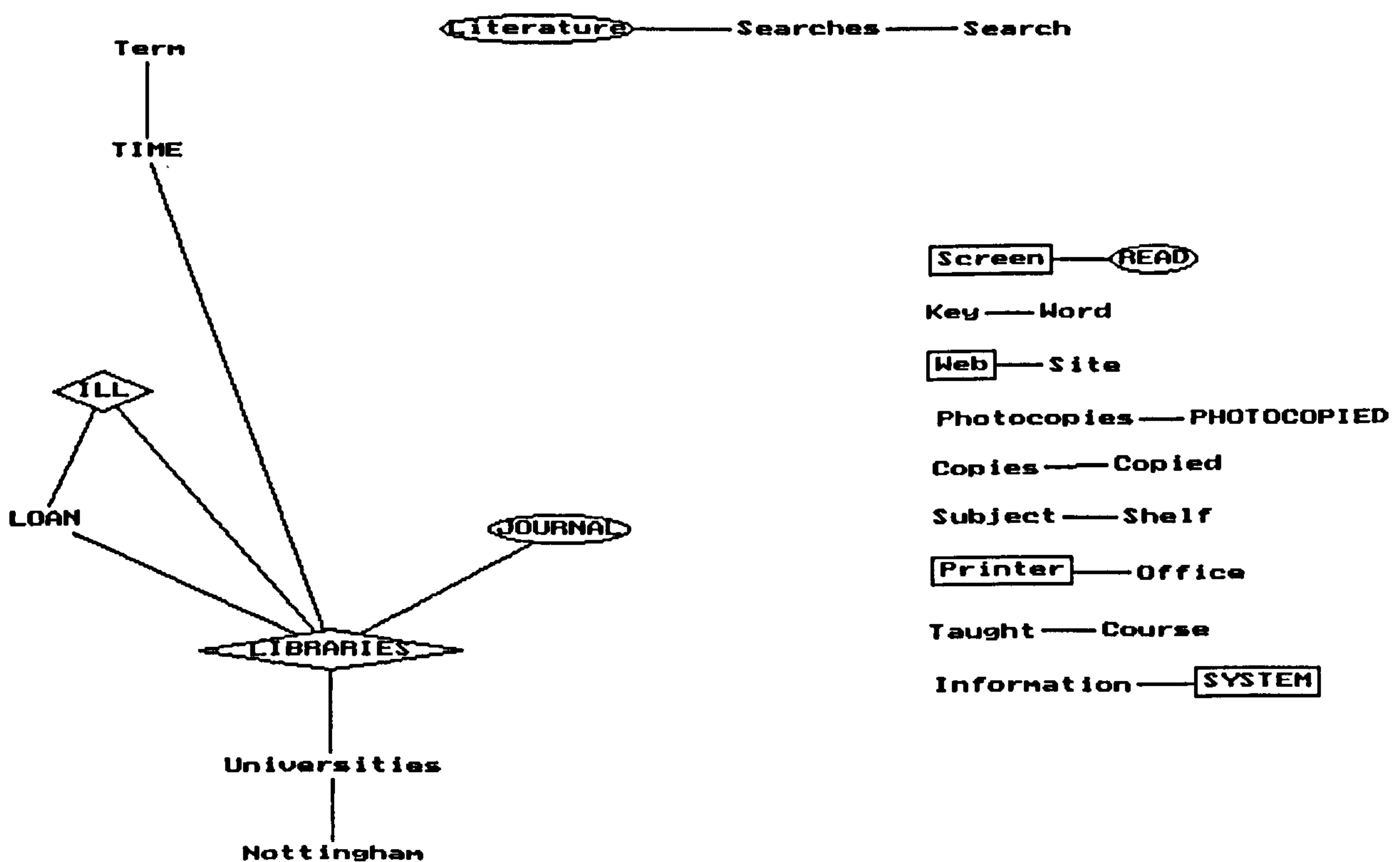
The core of words for the geography benchmarking corpus was estimated graphically from the Bradford-like distribution of the prompt words. The non-linear section of the graph included all words ranking above Log 3.0, which gave a core of words as follows:

LIBRARIES, TIME, JOURNAL, ILL, RESEARCH, ARTICLE, LOOKING, FINDING, WORK, BOOK, PAPER, READ, LOAN, SYSTEM, PROBLEM, ACCESS, STUDENT, PHOTOCOPIED, WEEK, YEAR.

Global network diagrams

The global association network diagram for the benchmarking interviews with geography researchers, is shown at two threshold values of the association index in Figures 60 and 61.

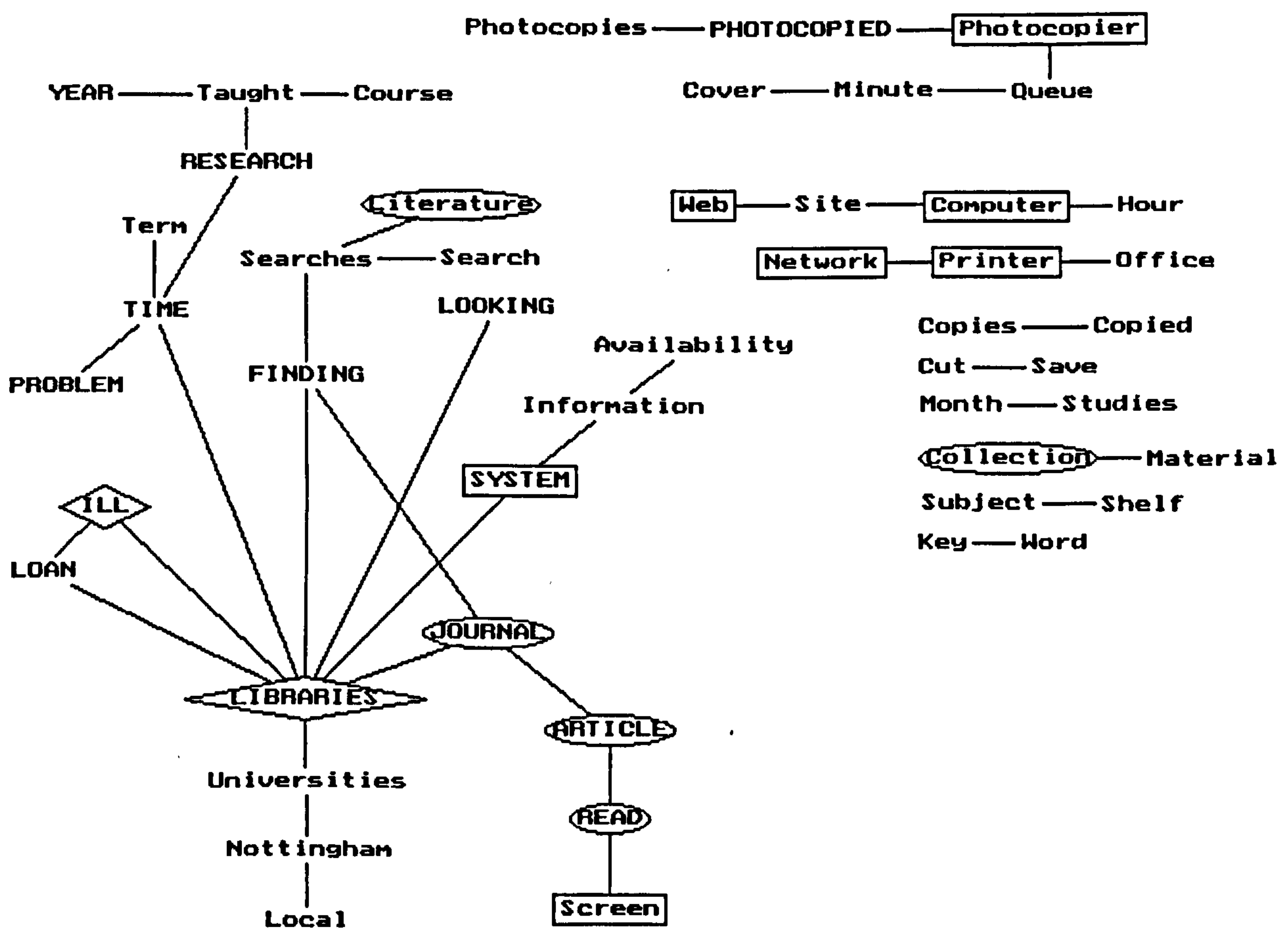
Figure 60: The global association network diagram from the benchmarking interviews with geography researchers (1)
(threshold $S = 0.12$)



I have tried to lay this diagram out so as to aid comparison with equivalent previous diagrams, especially Figure 16 (representing all the benchmarking interviews) and Figure 38 (representing those for business researchers). Figure 60 is very similar to both. In all three, 'Libraries' is at the centre of the main network, {Literature-Search-Searches} forms a cluster, and there is a series of dyads, some more idiomatic than others. Although {Network-Printer-Office} (from Figure 16) is missing in Figure 60, the dyad {Printer-Office} is present. The dissociated cluster {Wait-Week-Day} from Figure 16 is

wholly absent from Figure 60. If we increase the detail by decreasing the threshold value, we get Figure 61. Again, I have tried in Figure 61 to maintain the layout of previous global association diagrams, especially Figure 60 so that it is clear how Figure 61 has grown from Figure 60.

Figure 61: The global association network diagram from the benchmarking interviews with geography researchers (2)
(threshold $S = 0.09$)



At this threshold level of the association index, $S=0.09$, the diagram shows the continuing central position of 'Libraries'. 'Journal' has not gained many links compared with Figure 17 (for all benchmarking interviews), although this is similar to Figure 39 (for business benchmarking interviews). Unlike Figure 39, however, is the inclusion of {Screen-Read} at 'Article'. The position of scholarly communication words is similar in all three diagrams. However, perhaps the most obvious difference between Figure 61 and the

equivalents for other benchmarking corpora is the emergence of three dissociated clusters, each featuring technology words. This is evidence that the category of technology is more discrete or, at least, more visible in the geography benchmarking interviews than is typical.

Again, an inclusion network diagram was generated to give a second overall view of the data.

Figure 62: The global inclusion network diagram from the benchmarking interviews with geography researchers (threshold I = 0.8)

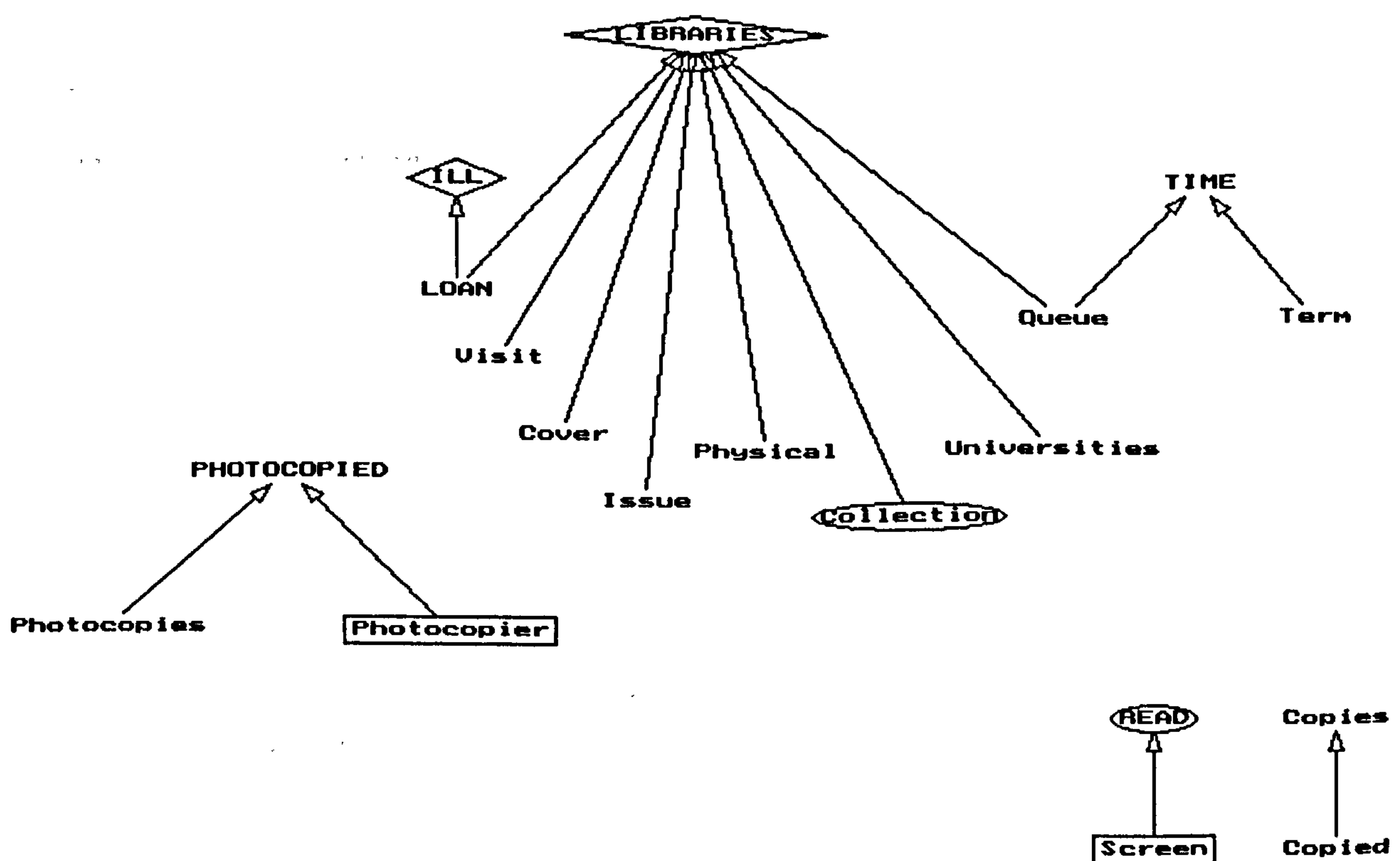


Figure 62 is very similar to Figure 18, the equivalent diagram for the benchmarking interviews as a whole, in that 'Libraries' is clearly central. One of the dissociated clusters from Figure 61 shows up as being hierarchically ordered under 'Photocopied', and {Screen-Read} appears as a hierarchical dyad. Other than this there is little evidence

here of any difference between geography researchers and others in terms of the category of technology words.

Again, it is difficult to infer much more from the global network diagrams so that a finer-grained analysis was undertaken using the leximappe procedure.

Leximappes

Figure 63: Geography interviews; benchmarking corpus - Leximappe A

Seed pair {Copies-Copied} $S = 0.85$

Minimum S for internal links = 0.088 Minimum S for external links = 0.060

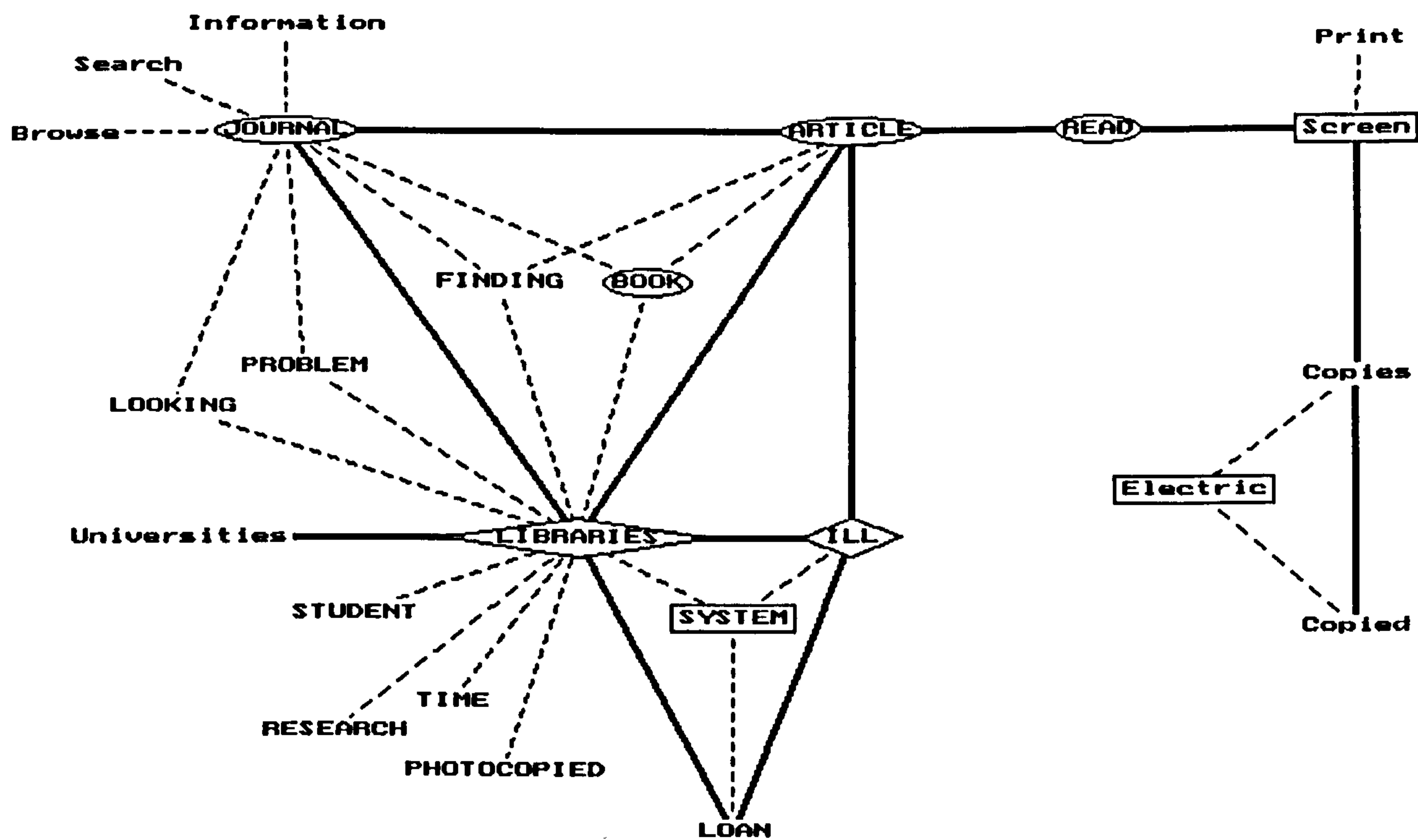


Figure 64: Geography interviews; benchmarking corpus - Leximappe B

Seed pair {Photocopies-Photocopied} S = 0.64

Minimum S for internal links = 0.068 Minimum S for external links = 0.060

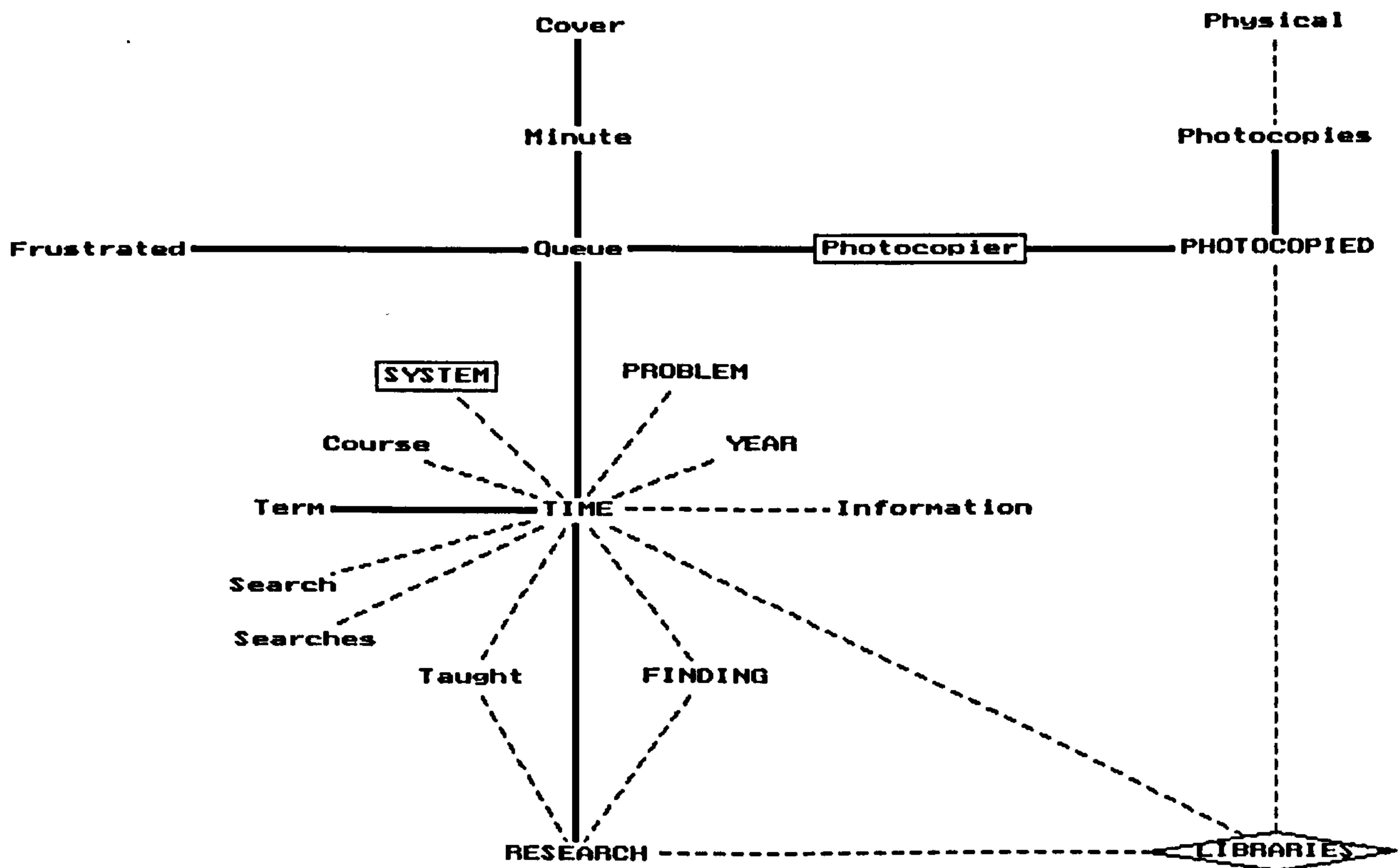


Figure 65: Geography interviews; benchmarking corpus - Leximappe C

Seed pair {Search-Searches} S = 0.54

Minimum S for internal links = 0.078 Minimum S for external links = 0.060

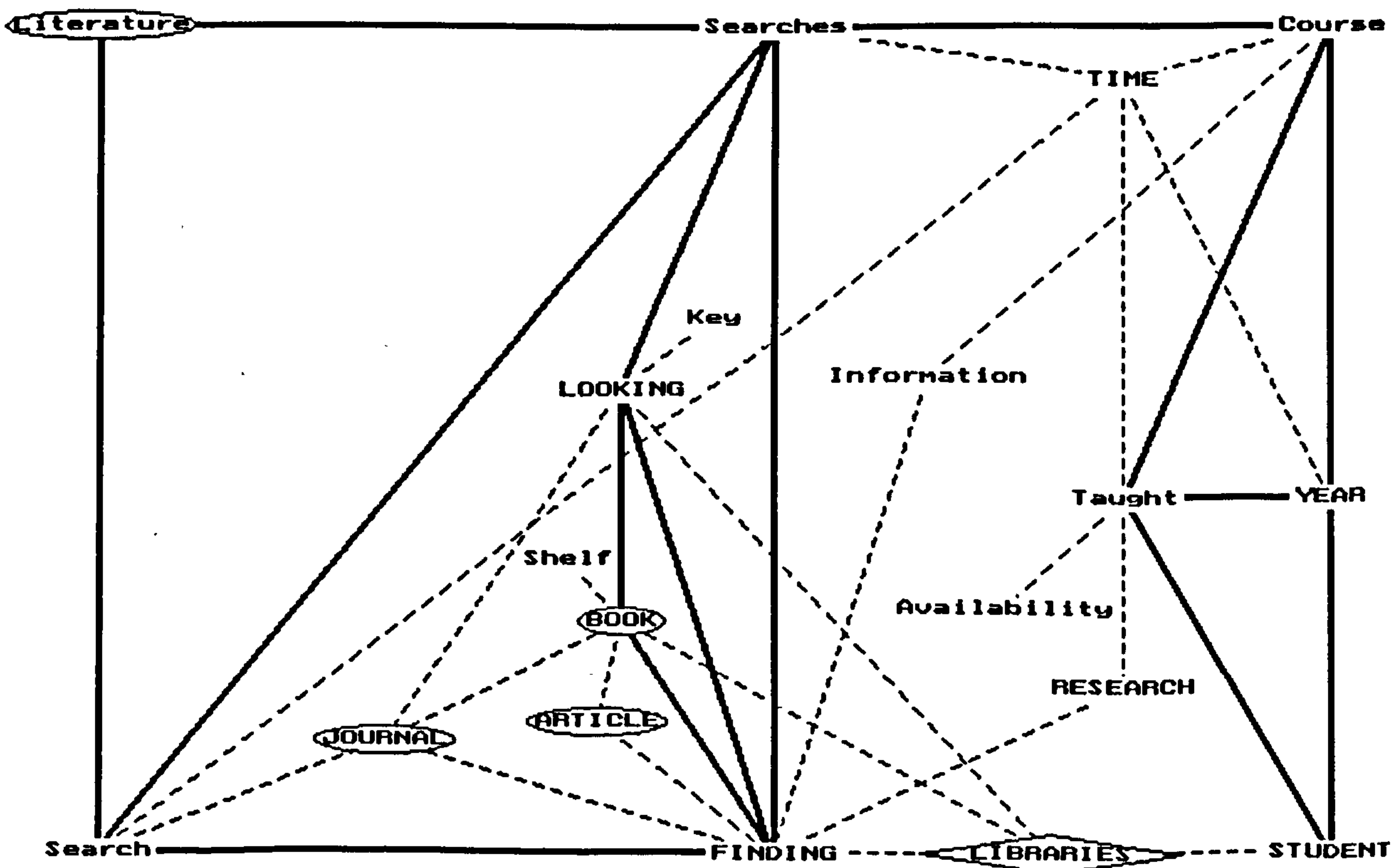


Figure 66: Geography interviews; benchmarking corpus - Leximappe D

Seed pair {Key-Word} S = 0.25

Minimum S for internal links = 0.047 Minimum S for external links = 0.040

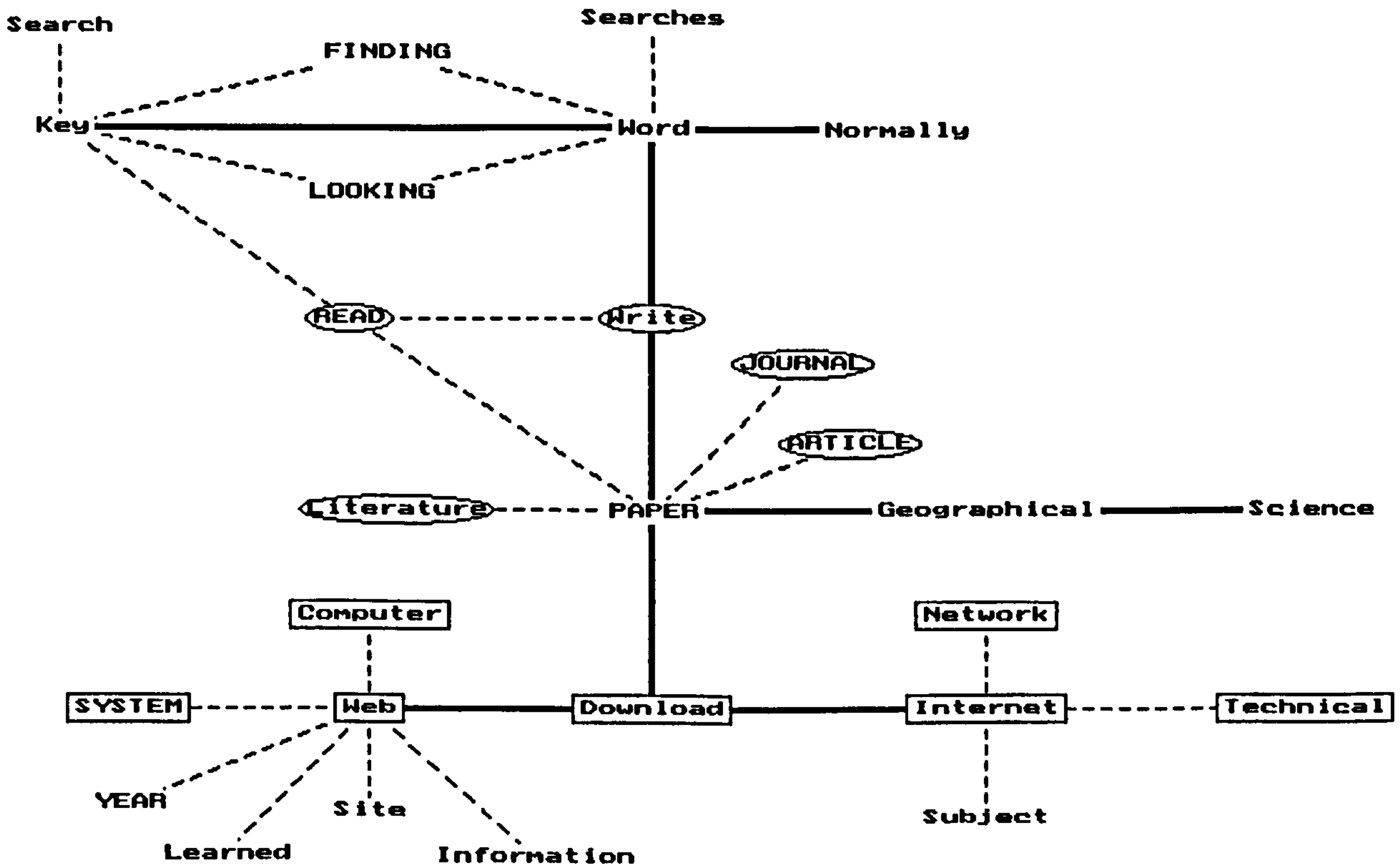


Figure 67: Geography interviews; benchmarking corpus - Leximappe E

Seed pair {Subject-Shelf} S = 0.14

Minimum S for internal links = 0.054 Minimum S for external links = 0.050

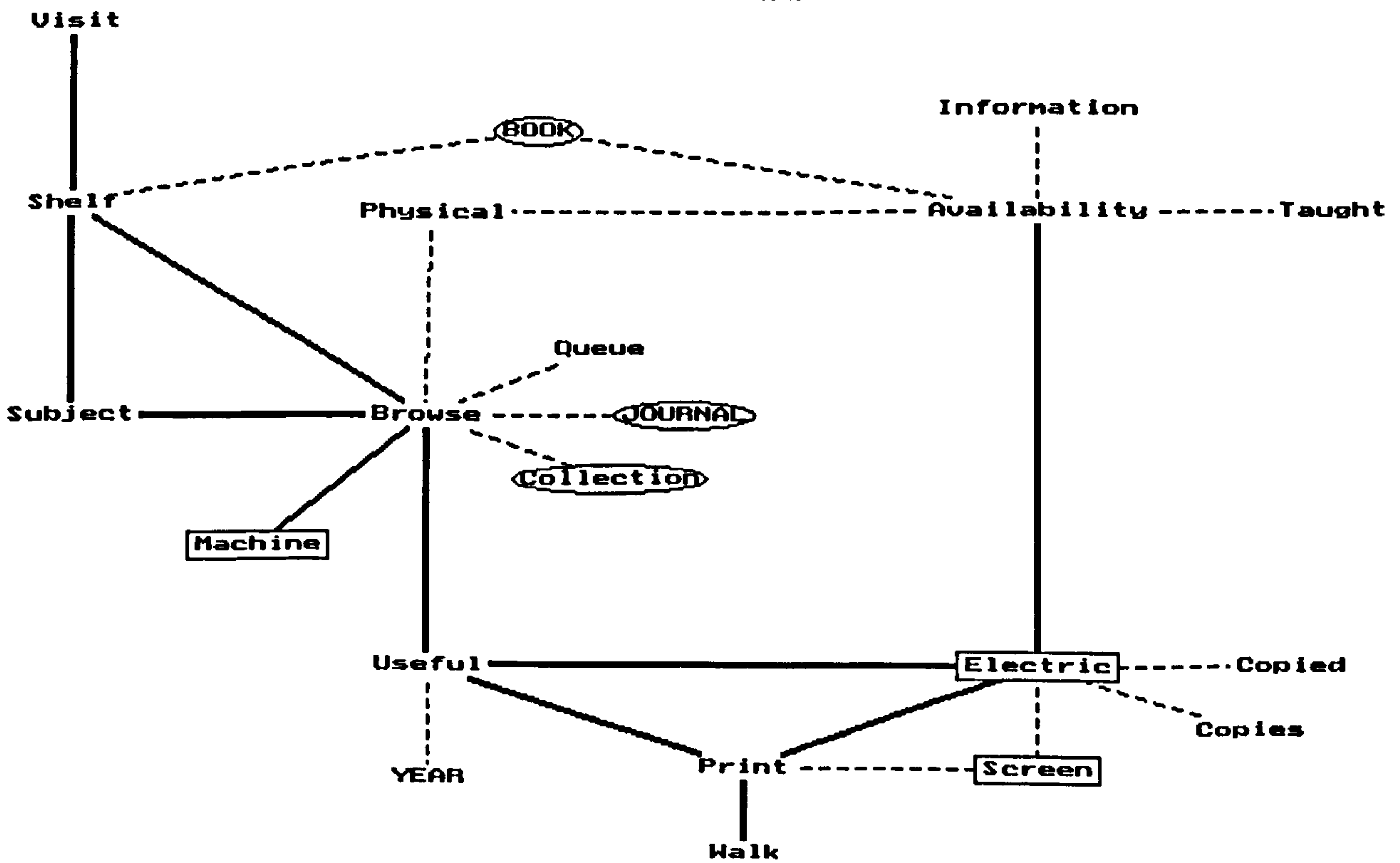


Figure 68: Geography interviews; benchmarking corpus - Leximappe F

Seed pair {Information-System} S = 0.13

Minimum S for internal links = 0.060 Minimum S for external links = 0.050

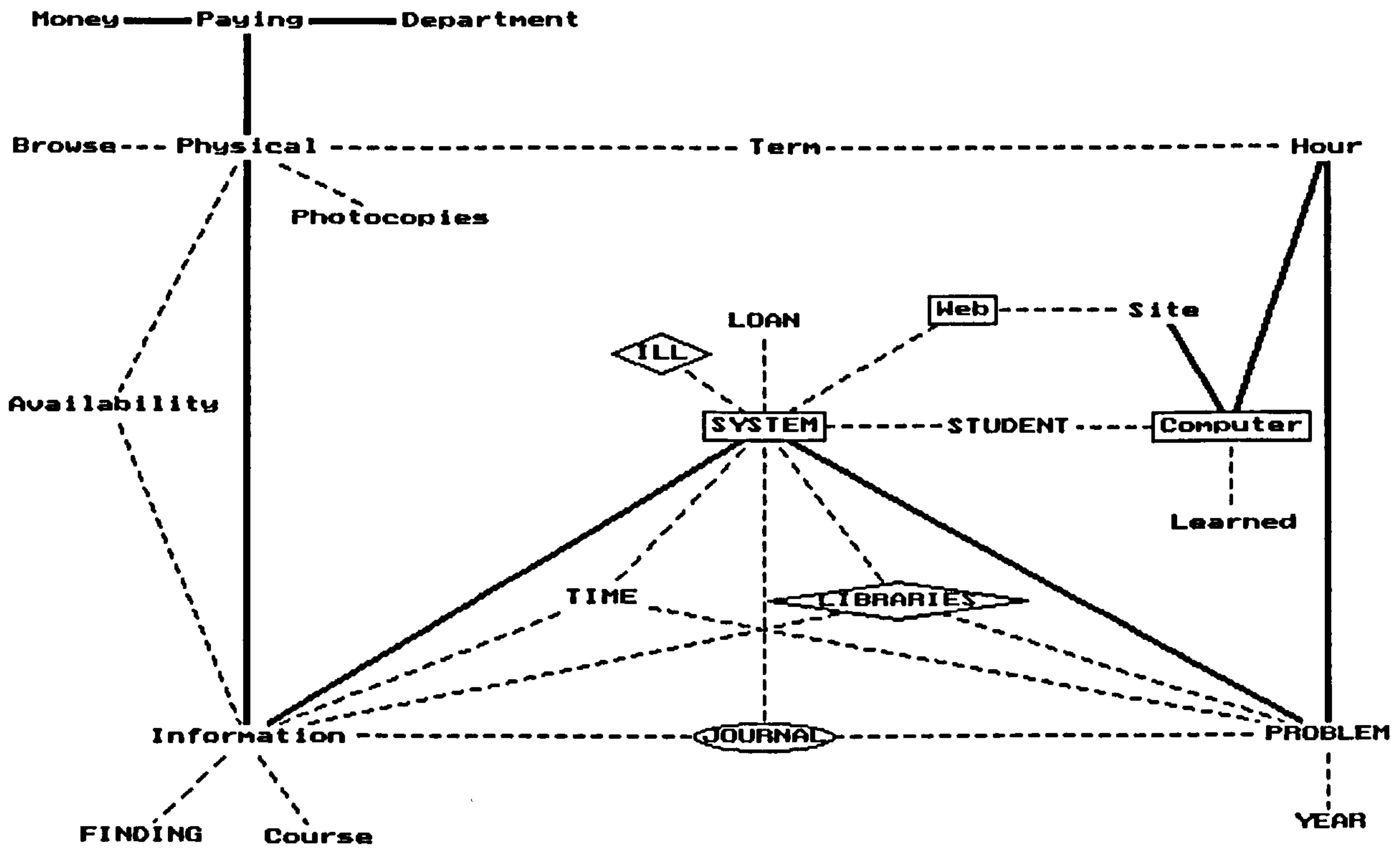
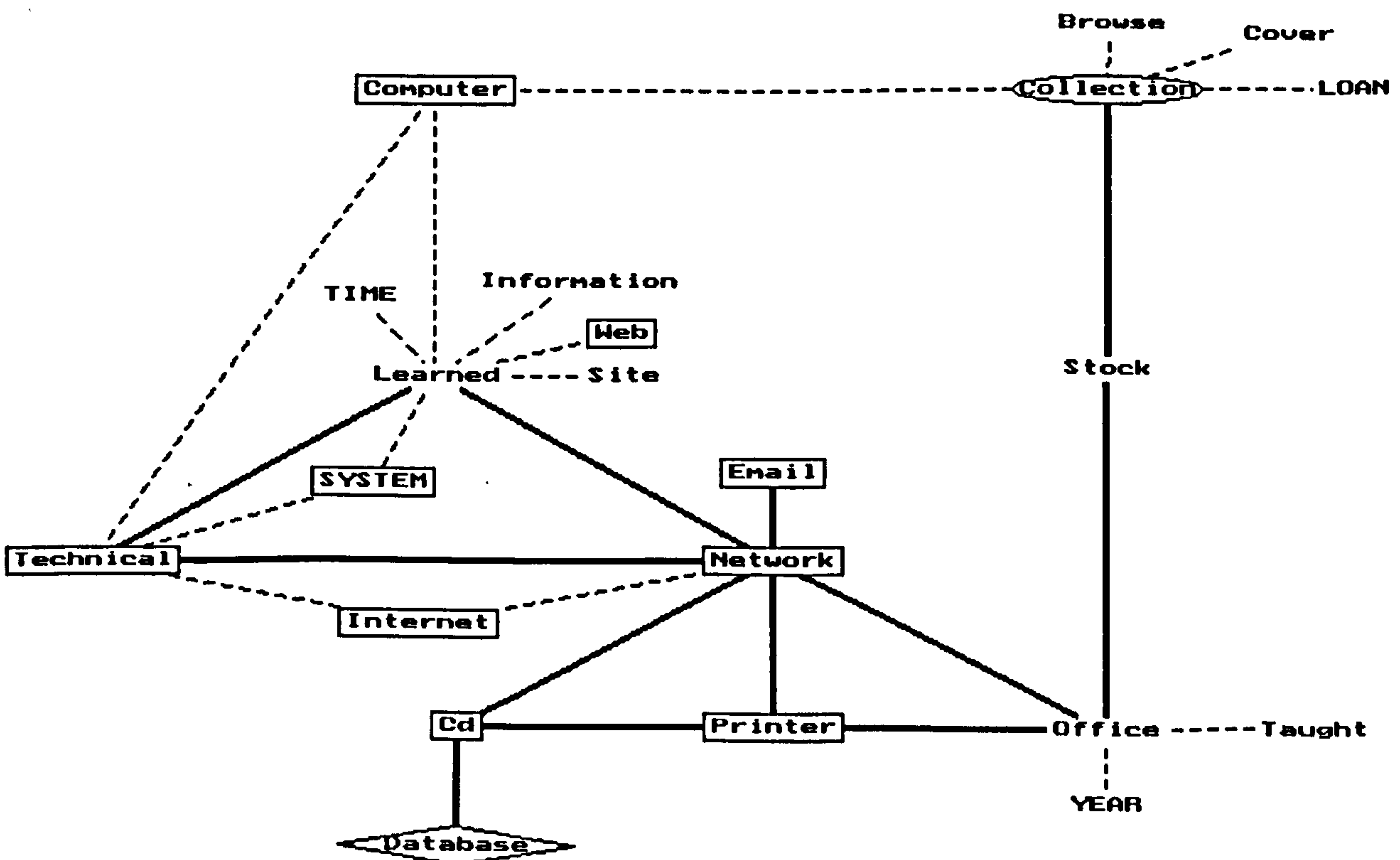


Figure 69: Geography interviews; benchmarking corpus - Leximappe G

Seed pair {Printer-Office} S = 0.13

Minimum S for internal links = 0.025 Minimum S for external links = 0.030



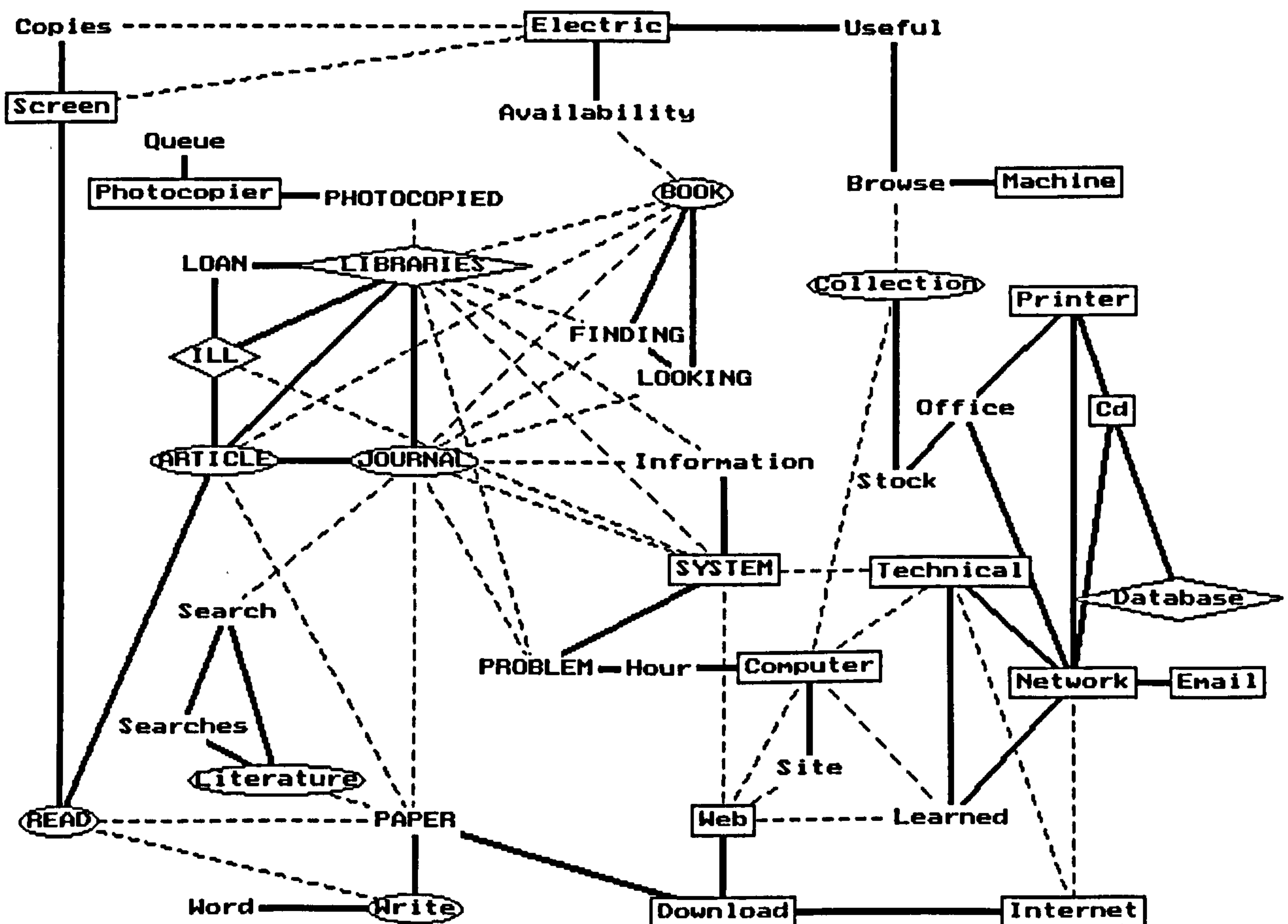
A comparison of this set of leximappes with the global network diagrams for the geography benchmarking interviews (Figures 60 and 61) shows that the main network in Figure 60 shows as part of Leximappe A (Figure 63), connected with the dyads {Read-Screen} and {Copies-Copied}. Leximappe B (Figure 64) comprises one of the dissociated clusters from Figure 61, centred on {Photocopier-Queue}. The information retrieval portion of Figure 61 {Literature-Searches-Finding} appears as Leximappe C. Some of the technology words appear as a cluster {Web-Download-Internet} in Leximappe D, most of the remainder comprising Leximappe G. Leximappes E and F pick up other dyads and regions of Figure 61.

Comparing Figures 63-69 with the leximappes for the business benchmarking interviews, we can see similarities and differences. Technology words are similarly split between two of the leximappes in each series (Figures 45 and 47 in the business benchmarking series, Figures 66 and 69 in the geography benchmarking series). Scholarly communication words are relatively scarce in the geography benchmarking series compared with that for the business benchmarking interviews, suggesting that this category was less important for geography researchers. Whereas Leximappe B of the business benchmarking series (Figure 42) related information retrieval {Literature-Search-Searches} to scholarly communication {Abstract-Text}, Leximappe C of the geography benchmarking series (Figure 65) relates information retrieval {Literature-Search-Searches} with taught courses and students. Another suggestive difference is in the relations of the dyad {Photocopies-Photocopied}. In the business benchmarking leximappe series (Figure 43) this is linked to financial issues {Cost-Charge-Money}, whereas in the equivalent geography benchmarking Leximappe B (Figure 64) it is linked to temporal issues {Queue-Minute-Time}. There is a strong suggestion here that geography researchers were talking in the benchmarking interviews more about students than research, and more about time than money, compared with business researchers.

Synthesis

To focus the analysis on the categories of scholarly communication, the information chain and technology, a synthesis diagram was again generated from the leximappes.

Figure 70: Geography interviews; benchmarking corpus - Synthesis diagram



This network representation of the three categories of words in the geography benchmarking interviews shows that scholarly communication is much less discrete a category than it was in the business benchmarking interviews (Figure 48) or in Figure 26, which showed the equivalent network for the benchmarking corpus as a whole. In Figure 70 there is no recognisable centre corresponding to most of the scholarly communication words. The cluster {Journal-Article-Read}, common to Figures 26, 48 and 70, is linked to other scholarly communication words in Figures 26 and 48, but this is not so in Figure 70. In addition, in Figure 70 there are more scholarly communication words some way

removed from {Journal-Article-Read}, such as 'Collection', 'Write' and 'Literature'. Technology words do not form a tight focus either, although they are more numerous and cohesive than in either Figure 26 or Figure 48. For example, the two clusters {Network-Office-Printer} and {Technical-Internet-Download} that were separate in Figure 26 are linked in Figure 70 to form the major region of technology words. The only other technology words are 'Machine', 'Electric' and 'Screen', which form a loose cluster toward the top of the diagram, and 'Photocopier'. Information chain words form a similar pattern to those in Figure 26, with 'Libraries' central and {ILL-Libraries} linked to 'System'. This is different to Figure 48, the business benchmarking interviews, although the position of 'Database' in Figure 70 is more similar to that in Figure 48 than that in Figure 26.

Few elements of the boundary region in Figure 70 between the categories of scholarly communication and technology are the same as they were in Figure 48 (business benchmarking interviews). The cluster {Electric-Copies} is common to both, but the geography researchers appeared less likely to link 'Web' with scholarly communication words such as 'Page', and 'Internet' is not related to scholarly communication at all in Figure 70, whereas 'Download', 'Access' and 'Research' all provided links between the two in Figure 48. 'System' appears to be the technology word most engaged with scholarly communication, and this is certainly because geography researchers were using this word to talk about interlibrary loans as well as about electronic or technical systems. This somewhat undermines the inclusion of 'System' as a technology word, except that in its very ambiguity it suggests links between machines and organisations. There is a reminder here of the use of this word in the literature on 'socio-technical systems' (Burns 1992, Cowan 1989, Kling 1989), where its role is to allow analysis to permeate any boundary between the social and the technical.

The boundary region between information chain and scholarly communication is similar to those in Figures 26 and 48, consisting mainly of links between 'Libraries' and {Journal-Article} and 'Book'. That between the information chain and technology, like

that between scholarly communication and technology, works through the ambiguous 'System', but also via {Photocopied-Photocopier}.

The final comparison to be made regarding the geography researchers is between the benchmarking and the evaluation interviews with them, and it is to the latter that I now turn.

7. Evaluation interviews with geography researchers

This section is concerned with the evaluation interviews with geography researchers. Unfortunately, there were only seven such interviews, so that the analysis undertaken here is necessarily limited. Nevertheless, an attempt is made to conduct a similar analysis to that offered in previous sections. Hence, the results are given in the following order:

- Graphical estimation of the core words used most frequently;
- Global network showing the overall distribution of the words in the interviews according to the S (association) and the I (inclusion) indexes;
- Leximappes for the geography evaluation interviews;
- Synthesis of leximappes to show ‘scholarly communication’, ‘information chain’ and ‘technology’ networks in relation to each other.

Graphical estimation of the core

The core of words for the geography benchmarking corpus was estimated graphically from the Bradford-like distribution of the prompt words. The non-linear section of the graph included all words ranking above Log 2.6, which gave a core of words as follows:

SYSTEM, SEARCH, DOCUMENT, JOURNAL, PAPER, ACCESS, SEARCHES, TRADITIONAL, ELECTRIC, LIBRARIES, GEOBASE, DATABASE, USEFUL.

Global network diagrams

The global association network diagram for the evaluation interviews with geography researchers is shown at two threshold values of the association index in Figures 71 and 72.

Figure 71: The global association network diagram from the evaluation interviews with geography researchers (1)
(threshold $S = 0.2$)

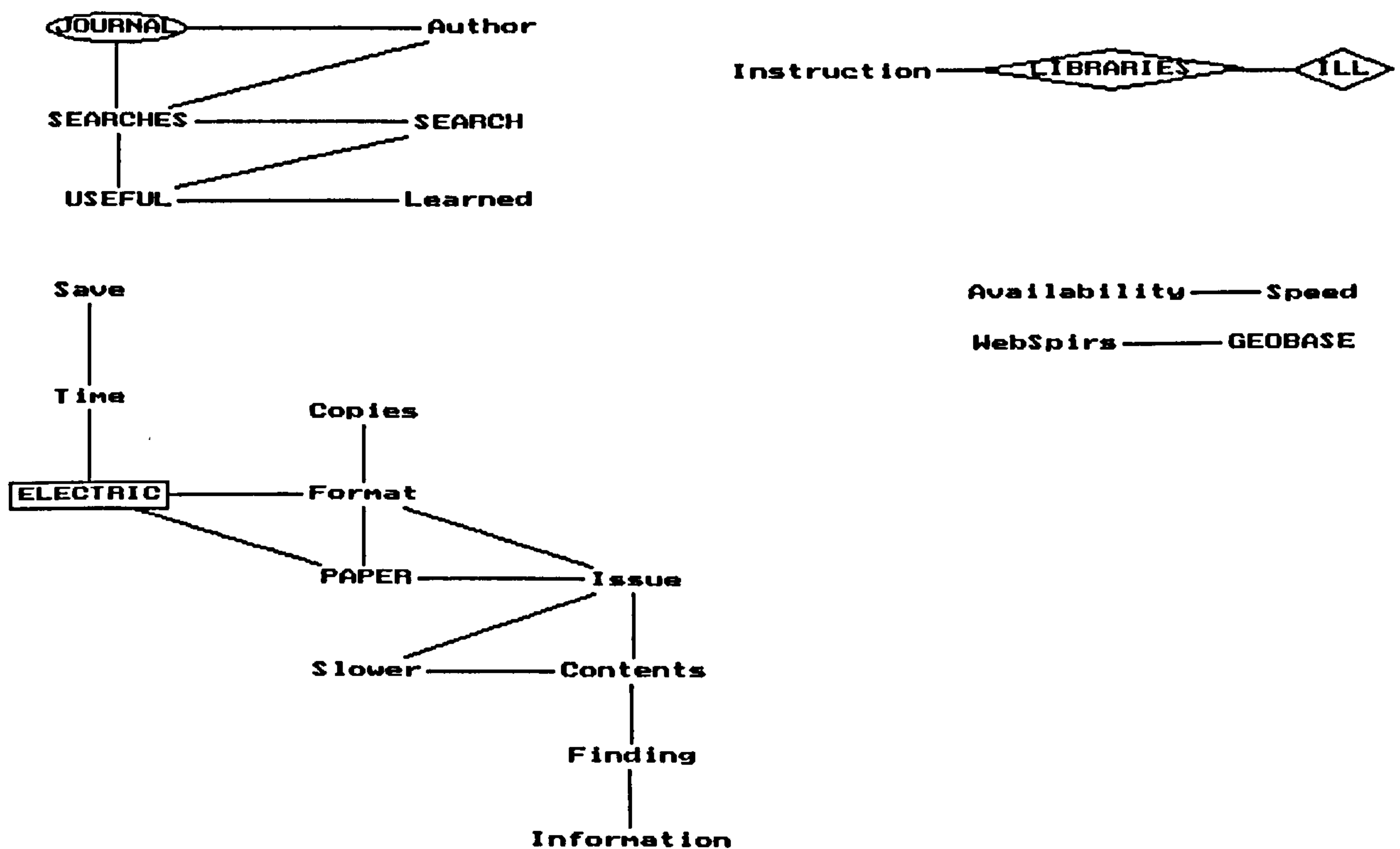
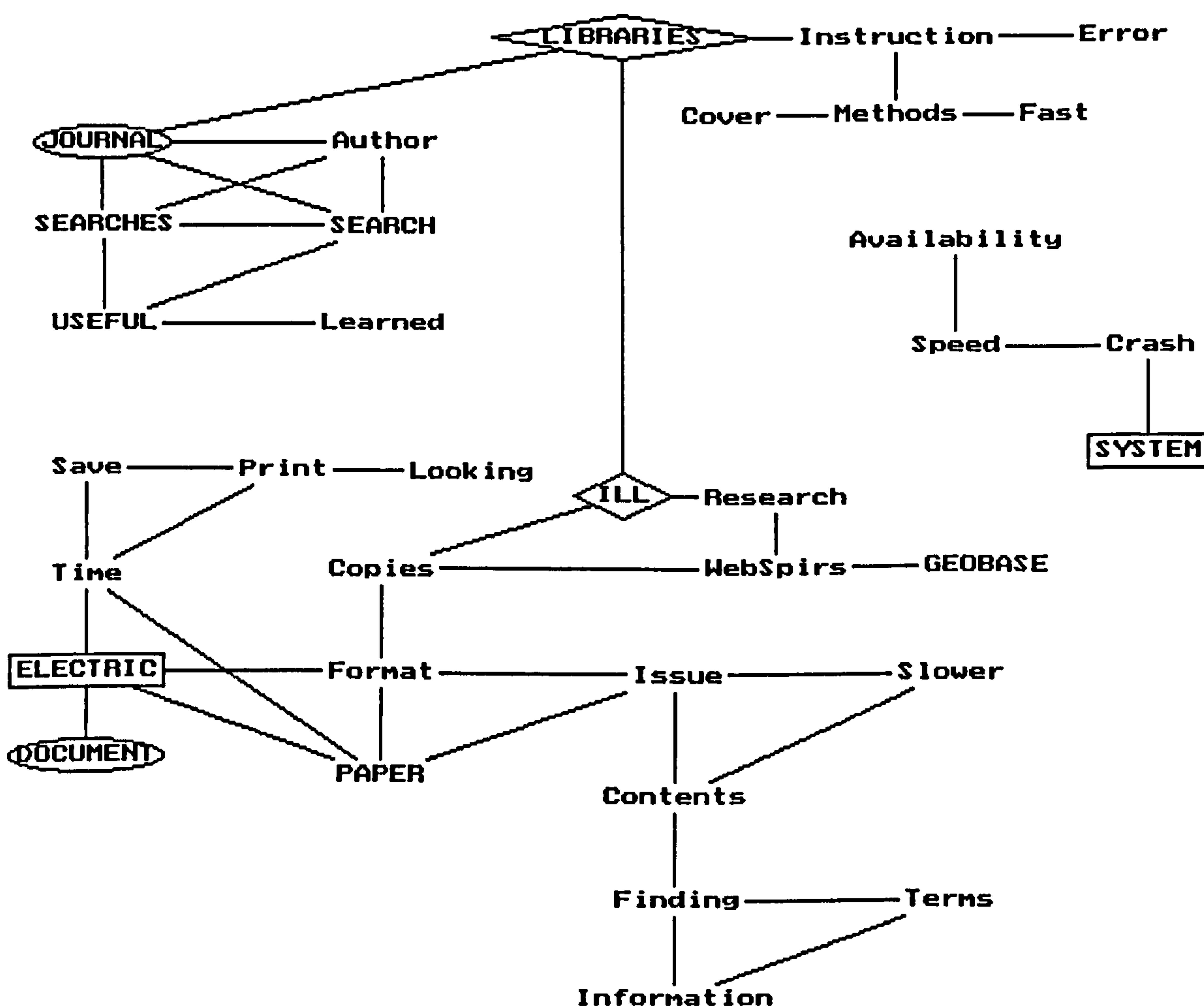


Figure 71 is clearly different from all previous association network diagrams. The major network identified involves {Electric-Format-Paper-Issue} and, whereas {Electric-Format} has been a common dyad in equivalent diagrams, such as Figure 27 relating to all evaluation interviews, it has not before been central to the main network. The second network around {Journal-Searches}, is more familiar from previous diagrams, but still represents a major difference. There are also many less dyads than in equivalent previous diagrams, suggesting that researchers talk either used less idiomatic expressions or embedded such expressions in wider networks. Figure 71 is also very different to the diagram representing the benchmarking interviews with geography researchers (Figure 60). It should be noted that {WebSpirs-Geobase} refers to the electronic document access system being evaluated. These results should be treated with considerable caution, given the very small sample size. Nevertheless, they were felt to be sufficiently interesting to warrant analysis at a finer level of detail. If the threshold value is decreased

to $S = 0.15$, we get Figure 72. Again, I have tried in Figure 72 to maintain the layout of Figure 71 so that it is clear how Figure 72 has grown from Figure 71.

Figure 72: The global association network diagram from the evaluation interviews with geography researchers (2)
(threshold $S = 0.15$)

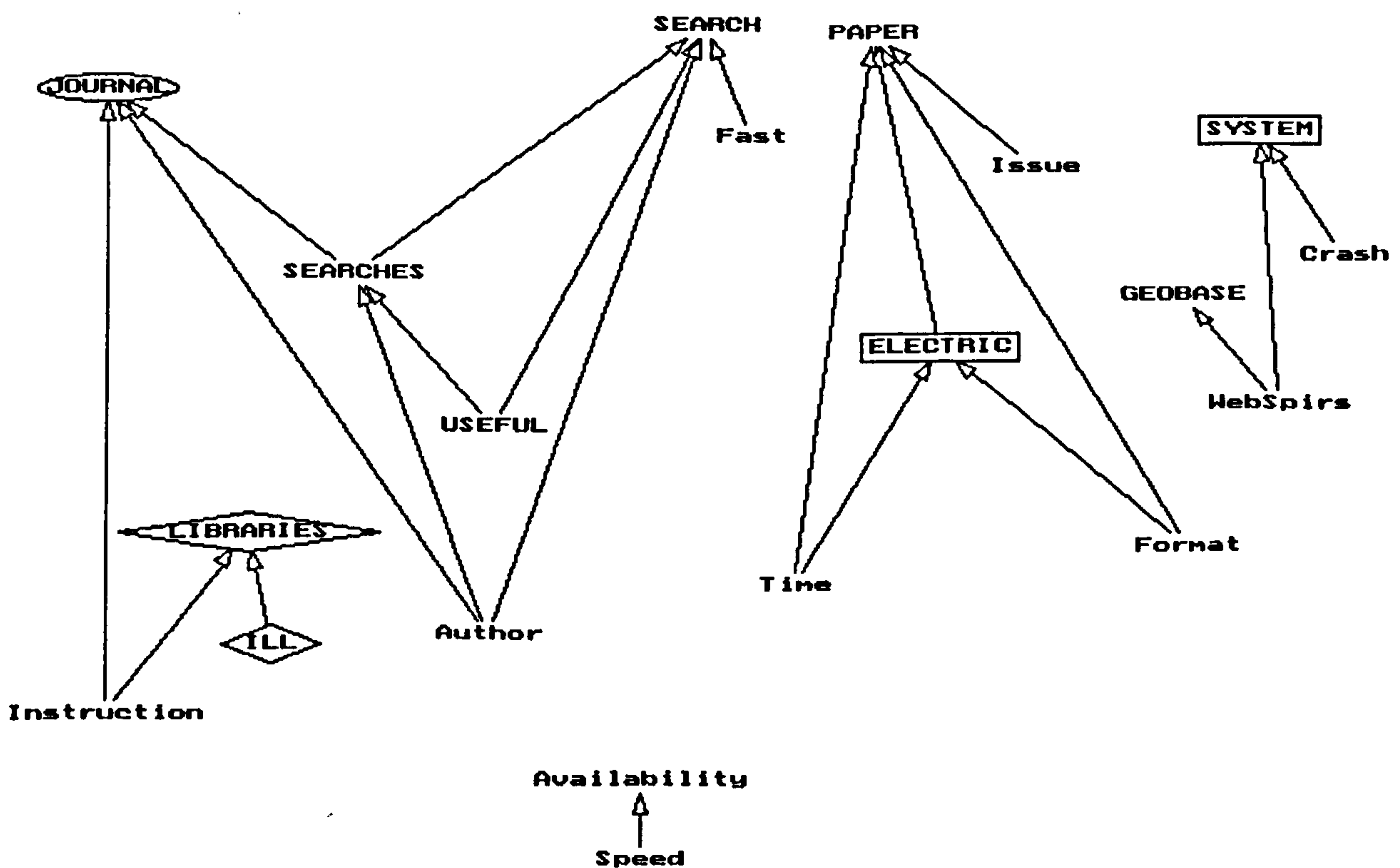


At this threshold level of the association index, $S=0.15$, the diagram shows how the dissociated cluster around 'Libraries' from Figure 71 is linked into the main networks at 'Journal' and 'ILL'. The main networks themselves have grown but are not linked to each other (apart from via 'Libraries') even at this threshold level. A new dissociated cluster involving the technology word 'System' has also been identified. Again, Figure 72 is unlike equivalent previous diagrams, such as Figure 28. Neither scholarly communication nor technology words are central to Figure 72, suggesting that these

categories did not operate as such in the researchers' interview talk. The only exception to this is 'Journal', which maintains the central position that it has held in previous networks. The information chain dyad {ILL-Libraries} is an important linking cluster. Compared to the relatively typical geography benchmarking interviews (Figure 61), Figure 72 offers few points of similarity, {Journal-Libraries} being perhaps the only one.

Again, an inclusion network diagram was generated to give a second overall view of the data.

Figure 73: The global inclusion network diagram from the evaluation interviews with geography researchers
(threshold I = 0.6)



Unsurprisingly, Figure 73 is dissimilar to previous inclusion diagrams, notably Figure 29 relating to all evaluation interviews and Figure 51 relating to business researchers. Figure 73 identifies the {Journal-Searches} actor-network as highly hierarchical, with both 'Journal' and 'Search' as important centres of translation. 'Paper' holds this

position with respect to the other main network from the association diagrams. The split between the two networks is clearly visible in the inclusion diagram. To see whether it persisted at a finer level of detail, the leximappe procedure was employed. However, because the geography evaluation corpus was so small, the number of different words related to each other in the association matrix (according to the criteria set out in the methodology section) was only 41. As a result, it was only possible to generate four leximappes in this series, the fourth one only containing nine words since that was the limit of the association data. These are shown below.

Leximappes

Figure 74: Geography interviews; evaluation corpus - Leximappe A

Seed pair {WebSpirs-Geobase} S = 0.60

Minimum S for internal links = 0.17 Minimum S for external links = 0.10

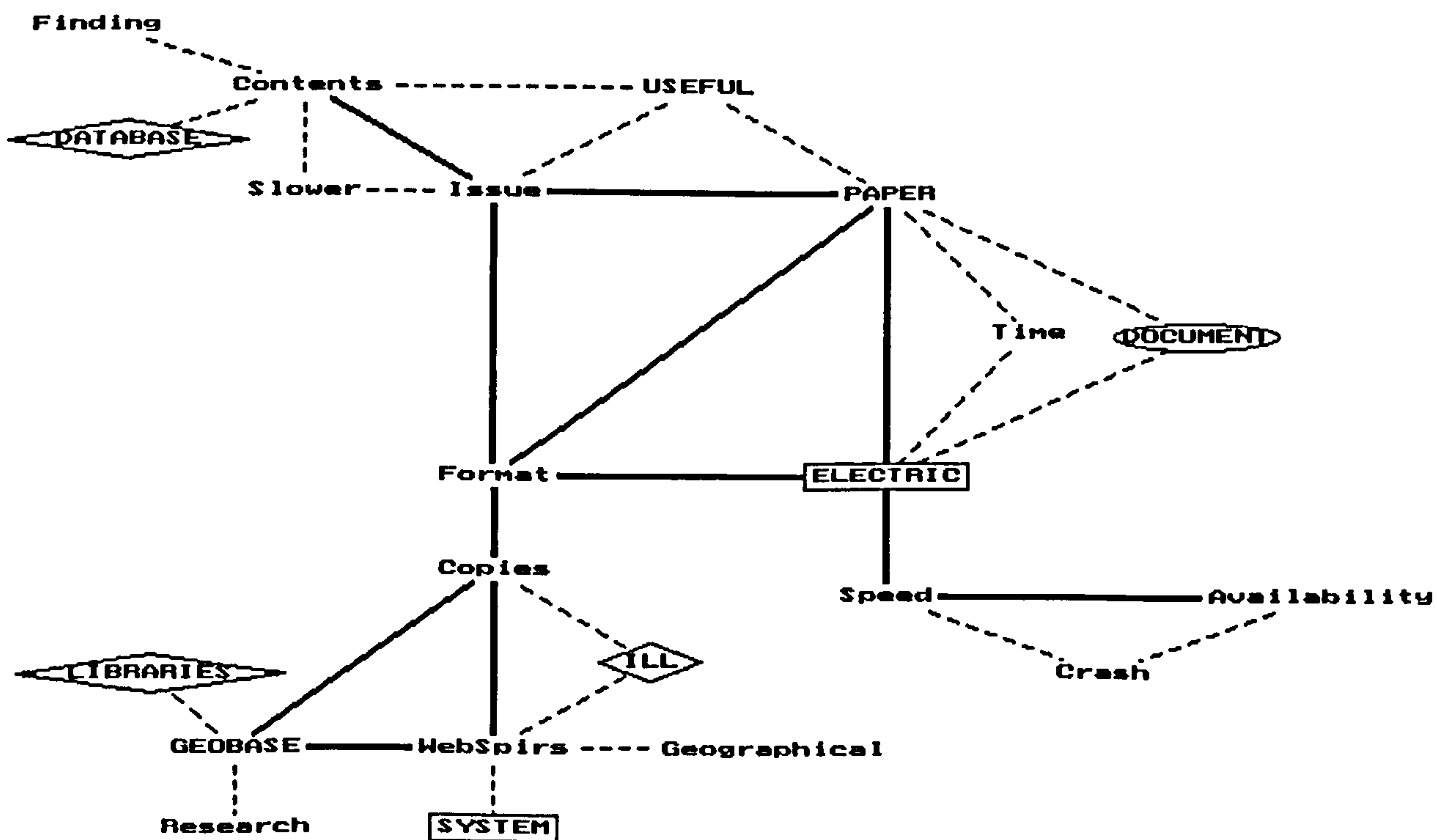


Figure 75: Geography interviews; evaluation corpus - Leximappe B
 Seed pair {Search-Searches} S = 0.45
 Minimum S for internal links = 0.17 Minimum S for external links = 0.10

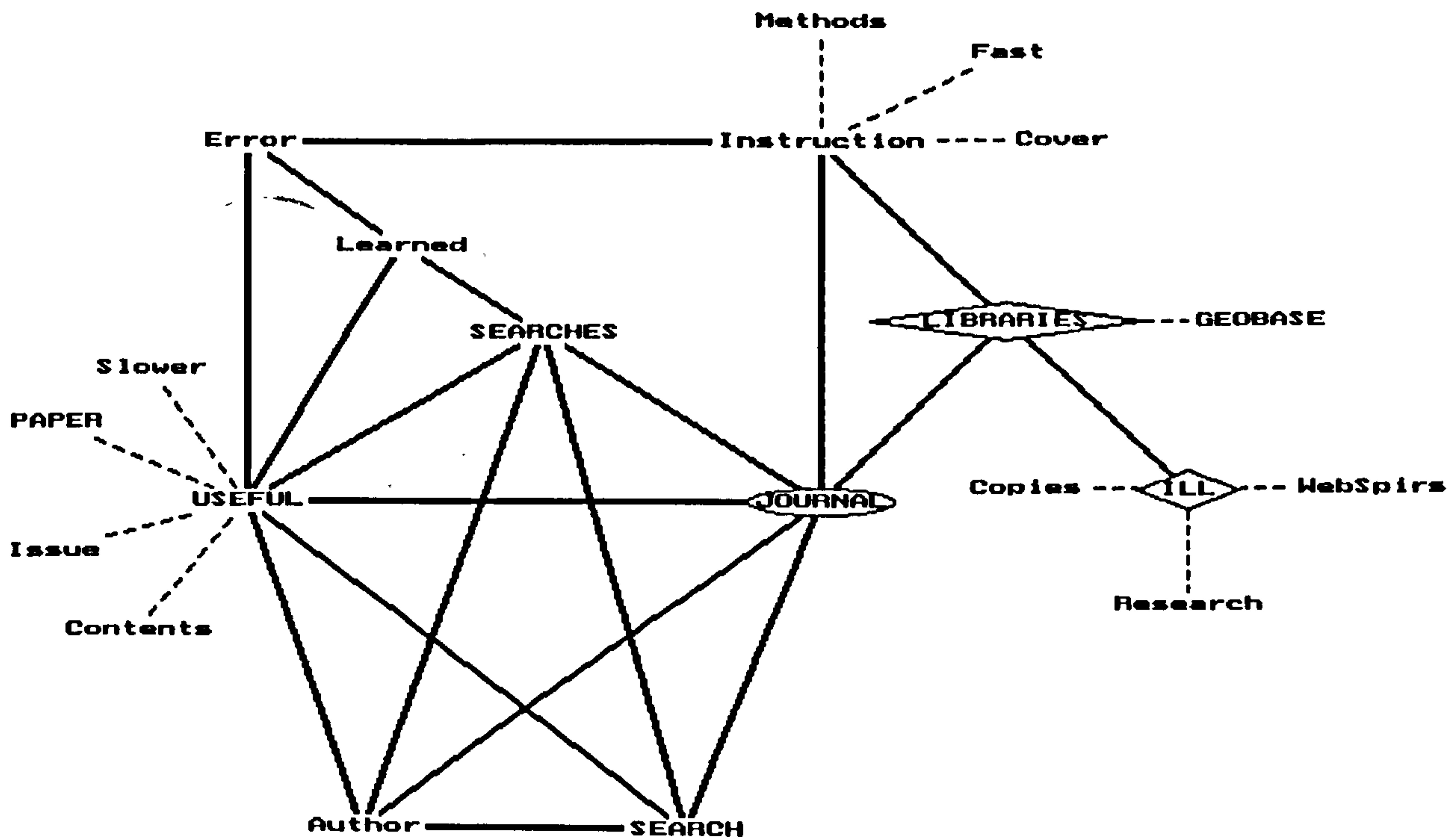


Figure 76: Geography interviews; evaluation corpus - Leximappe C
 Seed pair {Time-Save} S = 0.44
 Minimum S for internal links = 0.11 Minimum S for external links = 0.10

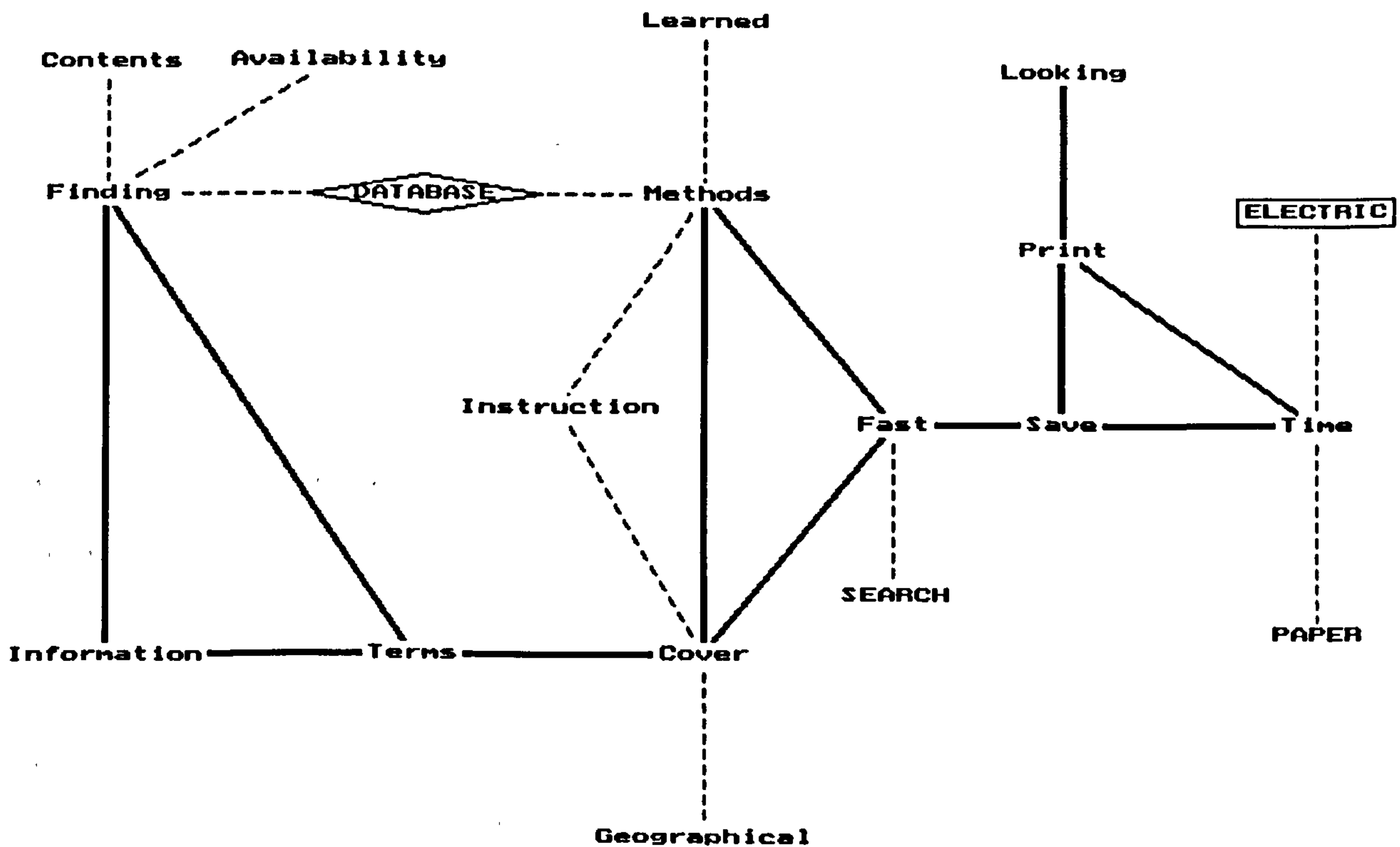
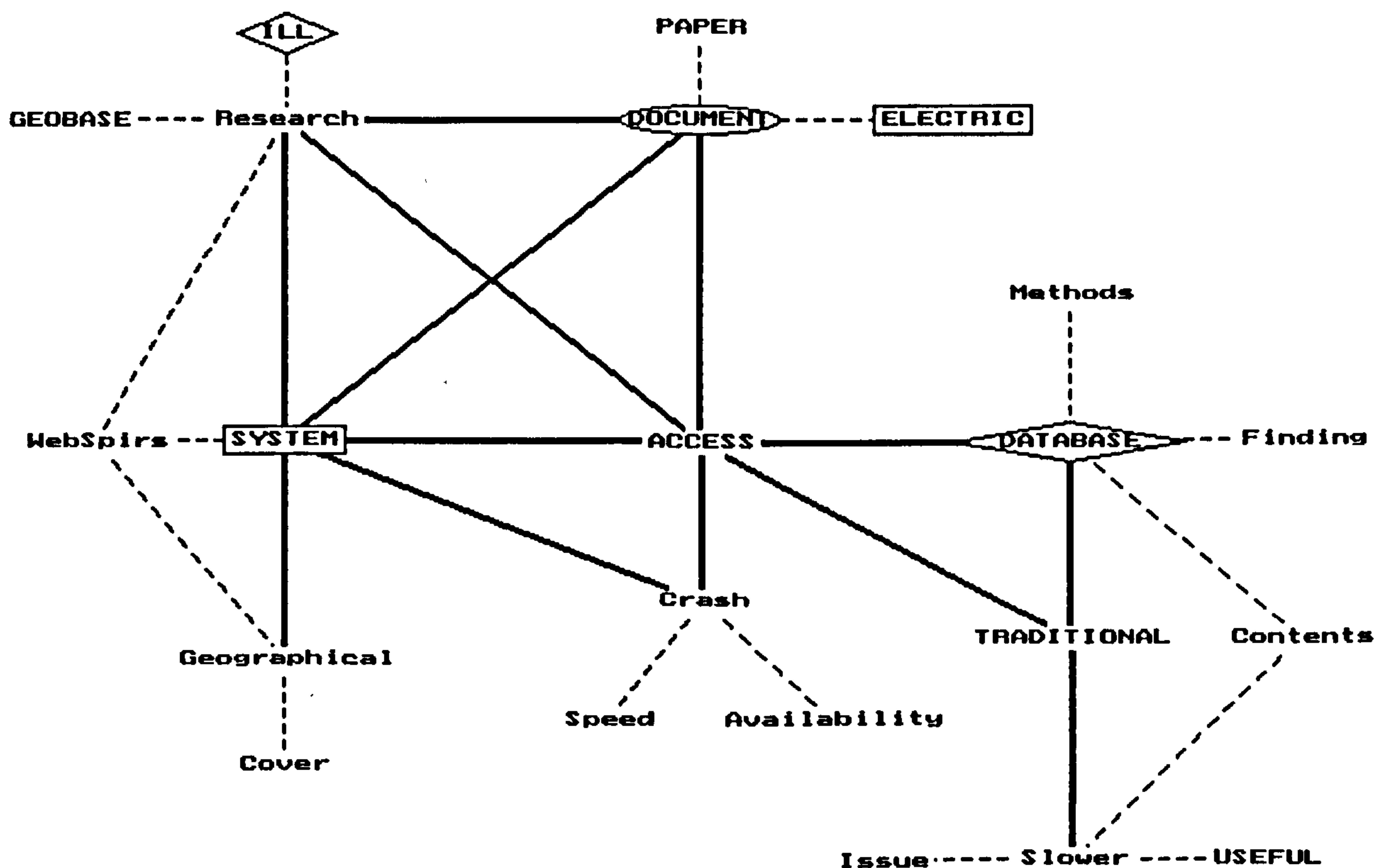


Figure 77: Geography interviews; evaluation corpus - Leximappe D

Seed pair {System-Crash} S = 0.18

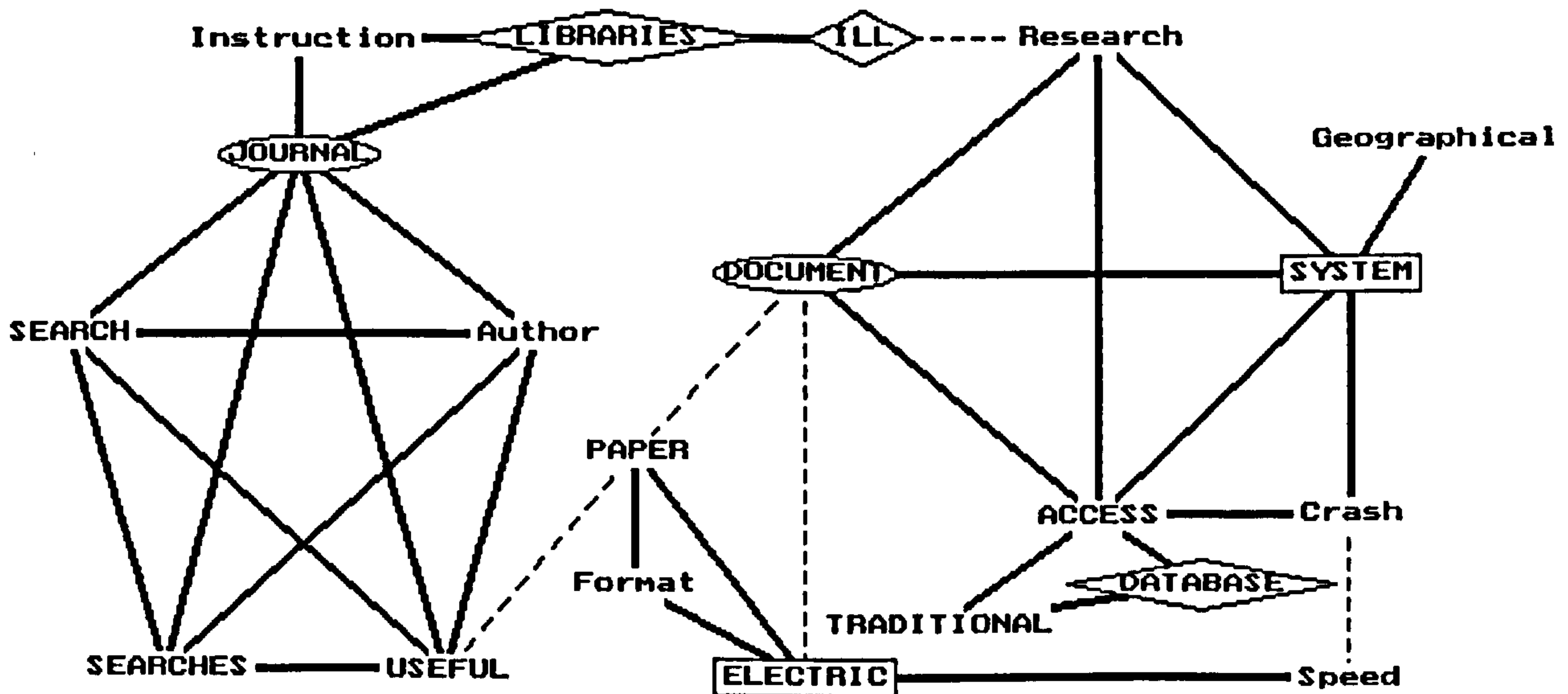
Minimum S for internal links = limit of data Minimum S for external links = 0.10



Given the atypicality of the global network diagrams, it is no surprise that the series of leximappes for the very small geography evaluation corpus is different to that of previous corpora. Leximappe A (Figure 74) shows how researchers talked of print or electric format documents, with 'Electric' being suggestively linked to {Speed-Availability-Crash} and 'Paper' to {Issue-Useful-Contents}. The central word 'Journals' appears in Leximappe B, linking {Libraries-ILL} to {Searches-Search}, implying that journals act to define both the traditional information chain and information retrieval. Leximappes C and D are less suggestive and are, perhaps, context for Leximappes A and B. The one interesting point is the inclusion of 'Research' in Leximappe D (Figure 77) with {Traditional-Database}, which might contrast with the relatively heavy emphasis placed on a link between taught students and information retrieval in the geography benchmarking interviews. There appears to be no particular pattern to the scholarly communication or technology category words, although the information chain category appeared similar to in previous leximappe series. A synthesis diagram was generated to investigate further.

Synthesis

Figure 78: Geography interviews; evaluation corpus - Synthesis diagram



As suspected, there was insufficient data from which to infer a relation between the categories of scholarly communication and technology. The category of the information chain, although only a minor part of the network, remains similar to previous synthesis diagrams, with {ILL-Libraries} linked to 'Journal', and separate from 'Database'.

Nevertheless, Figure 78 is insufficiently detailed to allow for comments to be made about boundary regions between any of the three categories.

8. Benchmarking interviews with manufacturing engineering researchers

As noted above, the interviews could be divided according to the subject area of the researchers being interviewed. At this point we are concerned with the interviews with researchers in academic departments focusing on manufacturing engineering. This corpus amounted to 65 interviews in total. Again, the analysis is split into two parts, relating to the benchmarking interviews and to the evaluation interviews. This section is concerned with the benchmarking interviews with manufacturing engineering researchers. There were 42 such interviews. Once again, the results are given in the following order:

- Graphical estimation of the core words used most frequently;
- Global network showing the overall distribution of the words in the interviews according to the S (association) and the I (inclusion) indexes;
- Leximappes for the engineering benchmarking interviews;
- Synthesis of leximappes to show 'scholarly communication', 'information chain' and 'technology' networks in relation to each other.

Graphical estimation of the core

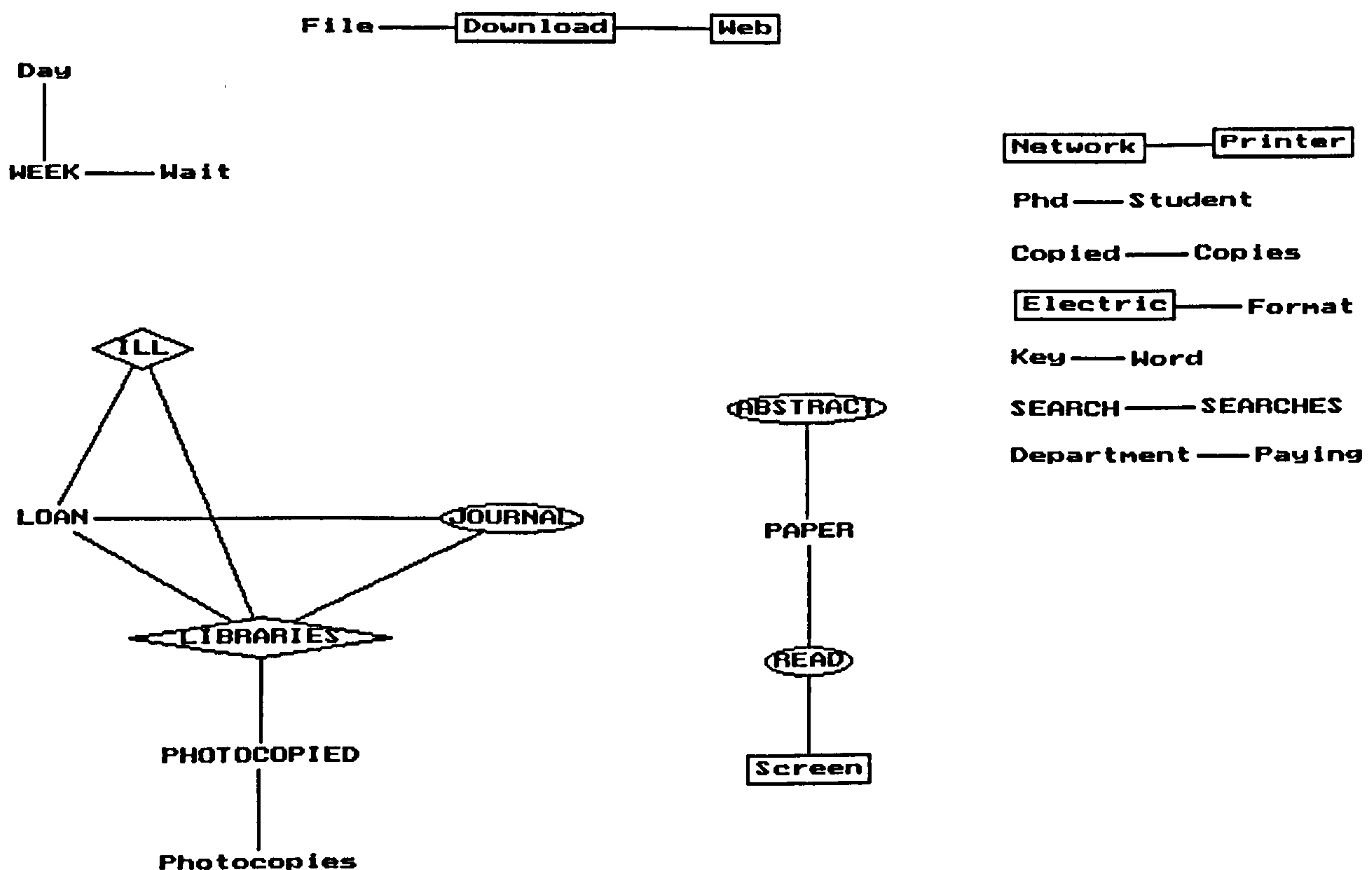
The core of words for the engineering benchmarking corpus was estimated graphically from the Bradford-like distribution of the prompt words. The non-linear section of the graph included all words ranking above Log 2.9, which gave a core of words as follows:

LIBRARIES, PAPER, TIME, FINDING, JOURNAL, RESEARCH, LOOKING, READ, LOAN, ILL, SYSTEM, SEARCH, WORK, PHOTOCOPIED, ABSTRACT, SEARCHES, WEEK, PROBLEM.

Global network diagrams

The global association network diagram for the benchmarking interviews with manufacturing engineering researchers, is shown at two threshold values of the association index in Figures 79 and 80.

Figure 79: The global association network diagram from the benchmarking interviews with manufacturing engineering researchers (1)
(threshold $S = 0.08$)



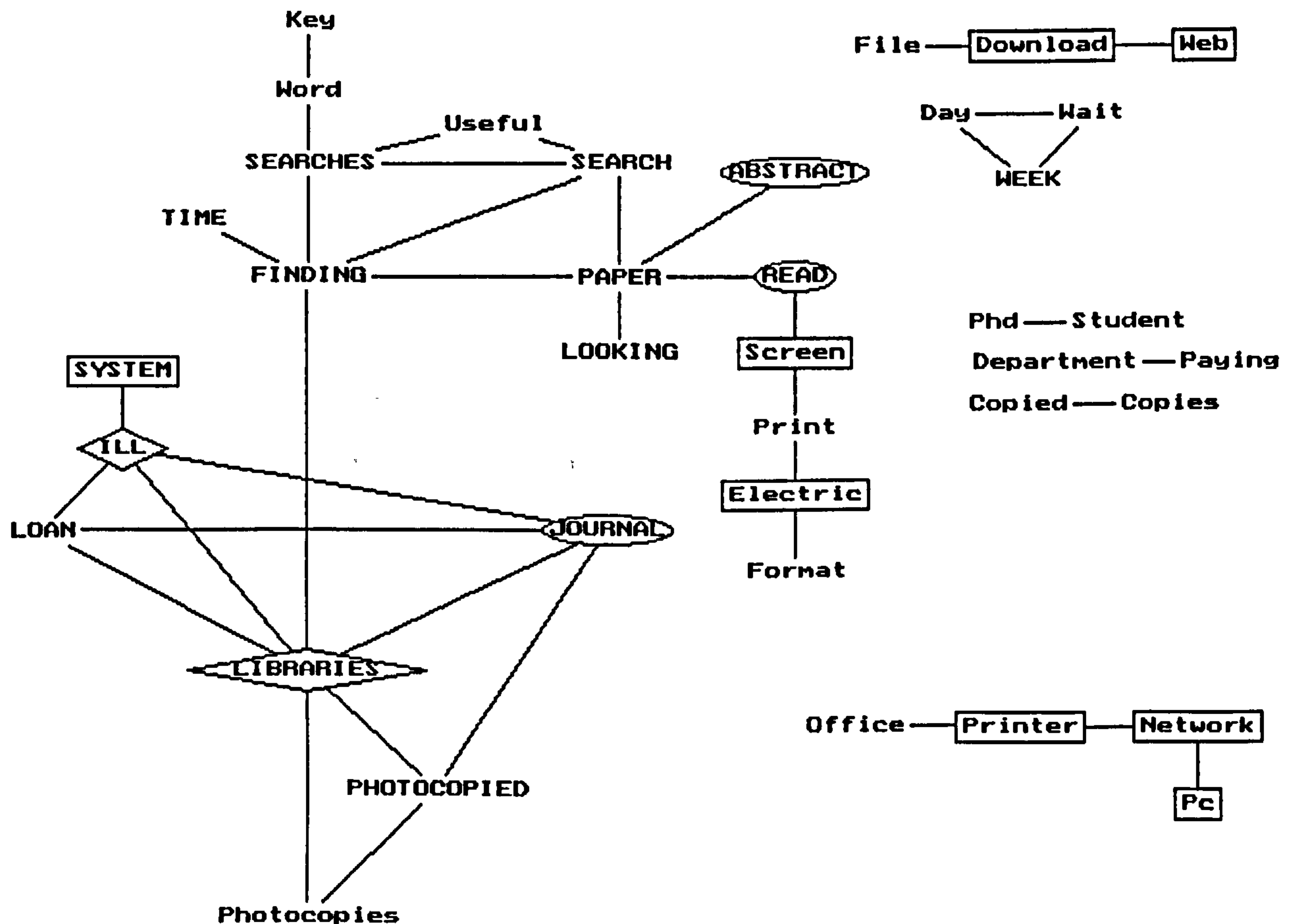
I have tried to lay this diagram out so as to aid comparison with equivalent previous diagrams, especially:

- Figure 16, representing all the benchmarking interviews;
- Figure 38, representing those for business researchers; and
- Figure 60, representing those for geography researchers.

Figure 79 shares features with all three of these diagrams. 'Libraries' is central to the main network, with a strong connection to 'Journal'. Also linked to 'Libraries' is {ILL-

Loan} and {Photocopies-Photocopied}, the former being common to the geography benchmarking interviews and the benchmarking corpus as a whole, the latter only appearing in the benchmarking corpus as a whole. We can say, then, that the link between 'Libraries' and {Photocopies-Photocopied} is particularly strong in the engineering benchmarking interviews. Of the dissociated clusters, {Screen-Read} is familiar as a dyad from Figures 16 and 60, and {Day-Week-Wait} is also familiar. The cluster {File-Download-Web} is not visible in previous equivalent diagrams, suggesting that this is particular to engineering researchers. The dyads in Figure 79 have all appeared before. If we increase the detail by decreasing the threshold value, we get Figure 80. Again, I have tried in Figure 80 to maintain the layout of previous global association diagrams, especially Figure 79 so that it is clear how Figure 80 has grown from Figure 79.

Figure 80: The global association network diagram from the benchmarking interviews with manufacturing engineering researchers (2)
(threshold $S = 0.06$)



At this threshold level of the association index, $S=0.06$, the diagram shows the continuing central position of 'Libraries'. 'Journal' has also gained links, although different ones to those in Figures 39 and 61, the equivalent diagrams for the business and geography benchmarking interviews. Here, 'Journal' appears to be linked more to access to information, indicated by {ILL-Loan} and 'Photocopied', rather than to information retrieval words such as 'Looking' and 'Finding'. This might suggest a different role for journals among manufacturing engineering researchers, although the results of the leximappe procedure should shed light on this. Indeed, information retrieval words are hardly linked to {Journal-Libraries} at all, forming a relatively discrete cluster toward the top of the main network and being linked to {Screen-Print}. The fact that {Screen-Read} is linked into the main network via 'Paper' rather than, as in Figure 17, via 'Article' may

indicate that manufacturing engineering researchers spoke of different units of scholarly communication than did other researchers. Indeed, 'Article' is wholly absent from Figure 80. It is likely, then, that 'Paper' should be considered a scholarly communication word in the engineering benchmarking interviews, functioning in some respects similarly to 'Article' in other interviews, but with certain differences. This is an example of partial synonymy being identified by the co-word networks¹². However, in order that analyses remain comparable, the existing sets of words are maintained for the scholarly communication category. Interestingly, this split into networks based on 'Journal' and 'Paper' closely parallels the structure of the geography evaluation interviews (see above). Focusing specifically on the category words, there is no clear pattern in Figure 80, although scholarly communication words are perhaps less common than in previous diagrams. Technology words again appear mainly in dissociated clusters.

An inclusion network diagram was generated to give a second overall view of the data.

12. Analysis of the frequency of occurrence of 'article' and 'paper' in the benchmarking interviews shows that in the business benchmarking interviews 'article' represented 0.38% of the words used and 'paper' represented 0.23%. For the geography benchmarking interviews the respective figures were comparable at 0.34% and 0.30%. However, for the engineering benchmarking interviews, the figures were 0.13% for 'article' and 0.79% for 'paper'. These figures support the contention that 'paper' in some way replaced 'article' in the engineering benchmarking interviews.

Figure 81: The global inclusion network diagram from the benchmarking interviews with manufacturing engineering researchers (threshold I = 0.5)

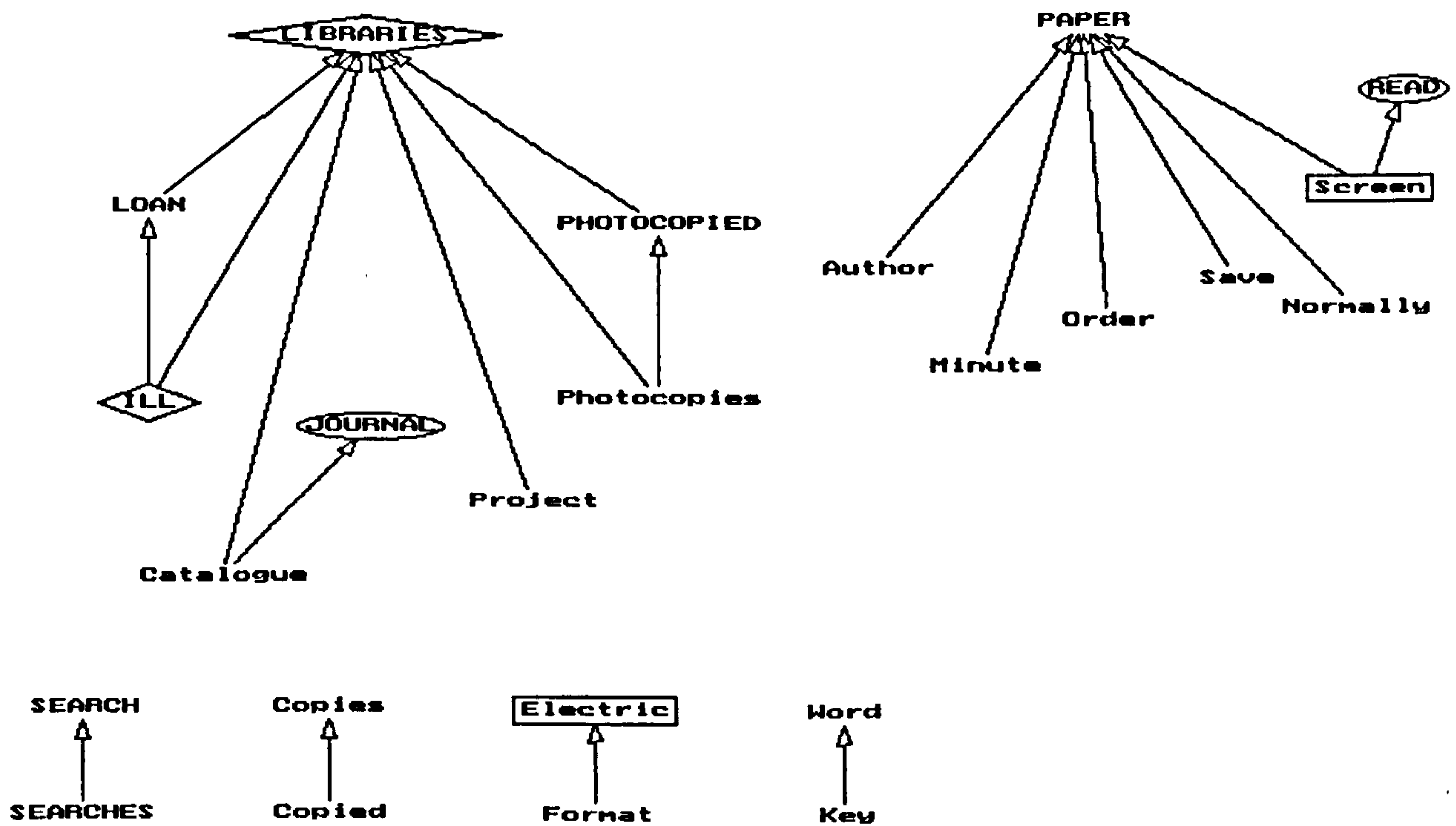


Figure 81 differs from previous inclusion diagrams representing benchmarking corpora, for example Figure 40 (business benchmarking interviews) and Figure 62 (geography benchmarking interviews). Whereas in those diagrams, 'Libraries' was certainly the dominant node, in Figure 81 'Paper' also acts as a focus for an actor-network. Interestingly, and as suggested by the association network diagram above, these two actor-networks are unrelated. The leximappe procedure was again used to investigate further these two actor-networks in the benchmarking interviews with manufacturing engineering researchers.

Leximappes

Figure 82: Manufacturing engineering interviews; benchmarking corpus - Leximappe A

Seed pair {Search-Searches} $S = 0.64$

Minimum S for internal links = 0.065 Minimum S for external links = 0.050

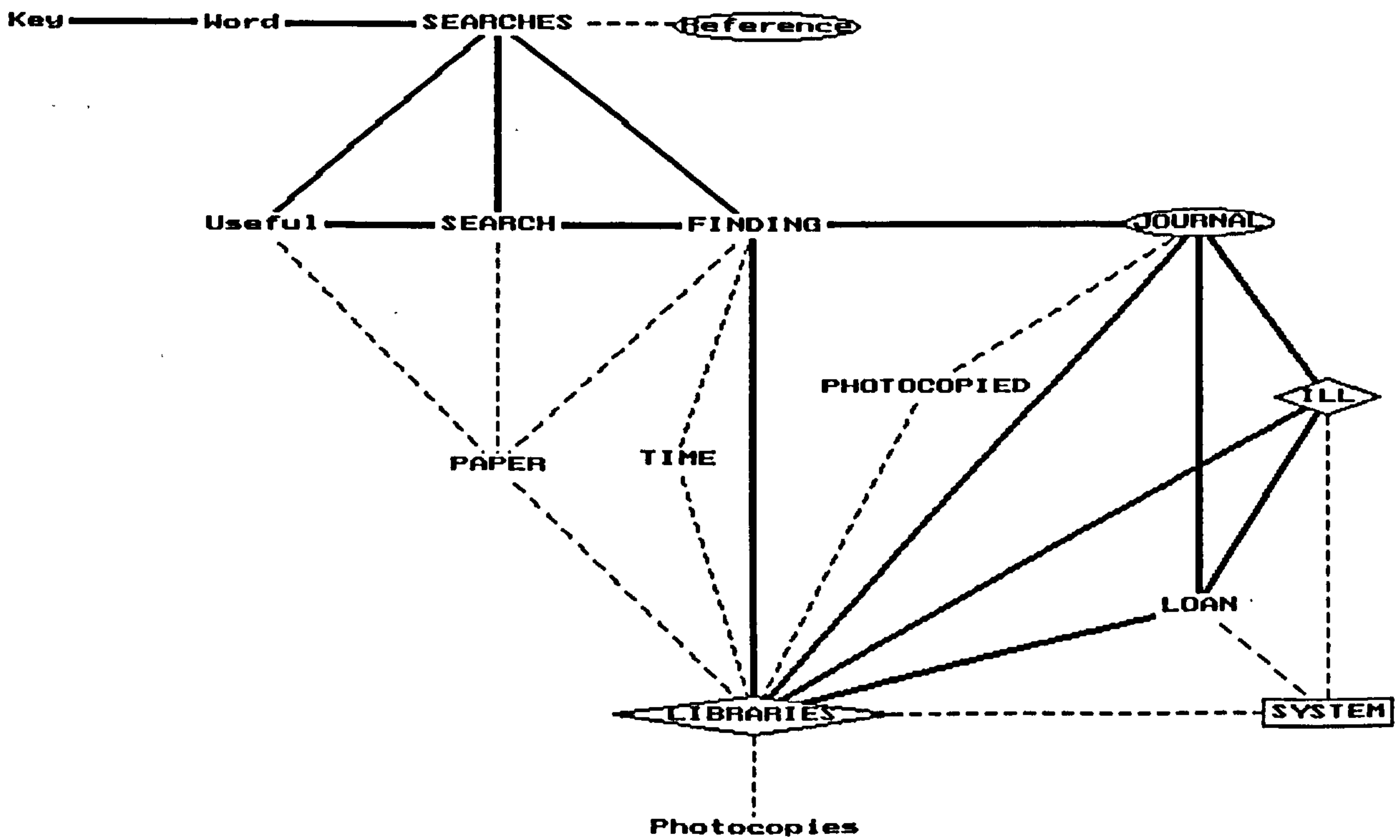


Figure 83: Manufacturing engineering interviews; benchmarking corpus - Leximappe B

Seed pair {Copies-Copied} S = 0.62

Minimum S for internal links = 0.036 Minimum S for external links = 0.040

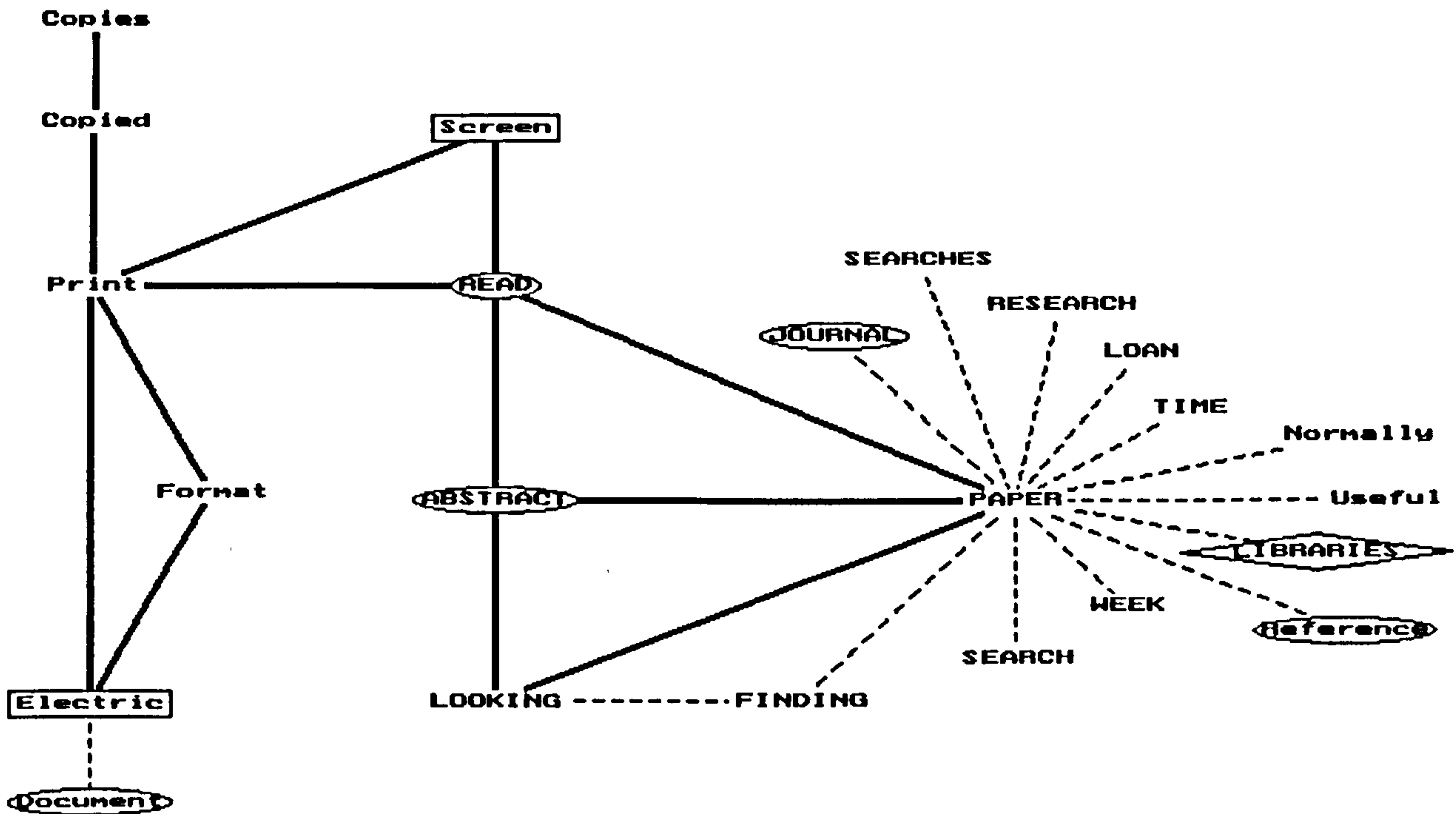


Figure 84: Manufacturing engineering interviews; benchmarking corpus - Leximappe C

Seed pair {Photocopies-Photocopied} S = 0.50

Minimum S for internal links = 0.025 Minimum S for external links = 0.025

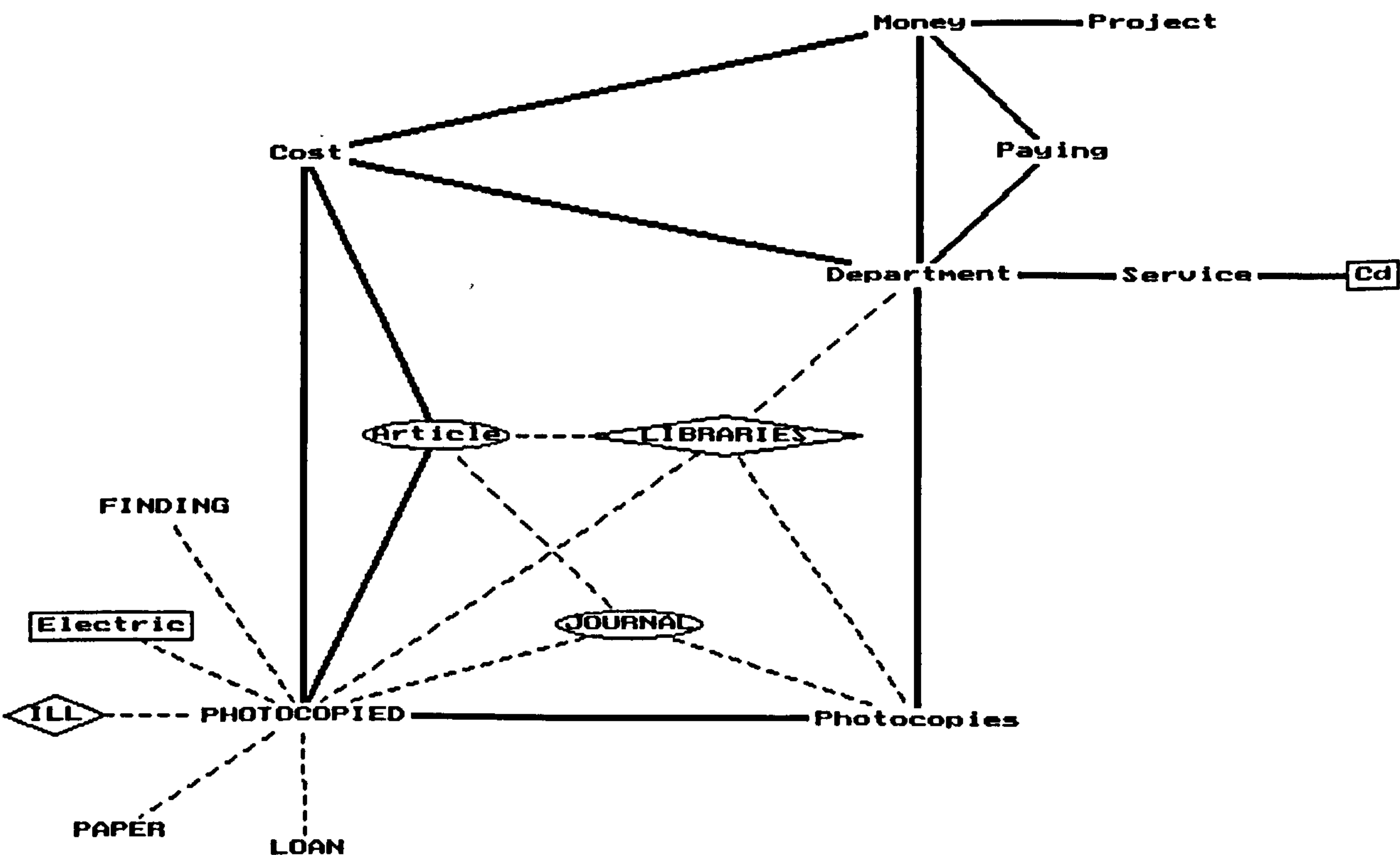


Figure 87: Manufacturing engineering interviews; benchmarking corpus - Leximappe F

Seed pair {PhD-Student} S = 0.096

Minimum S for internal links = 0.011 Minimum S for external links = 0.025

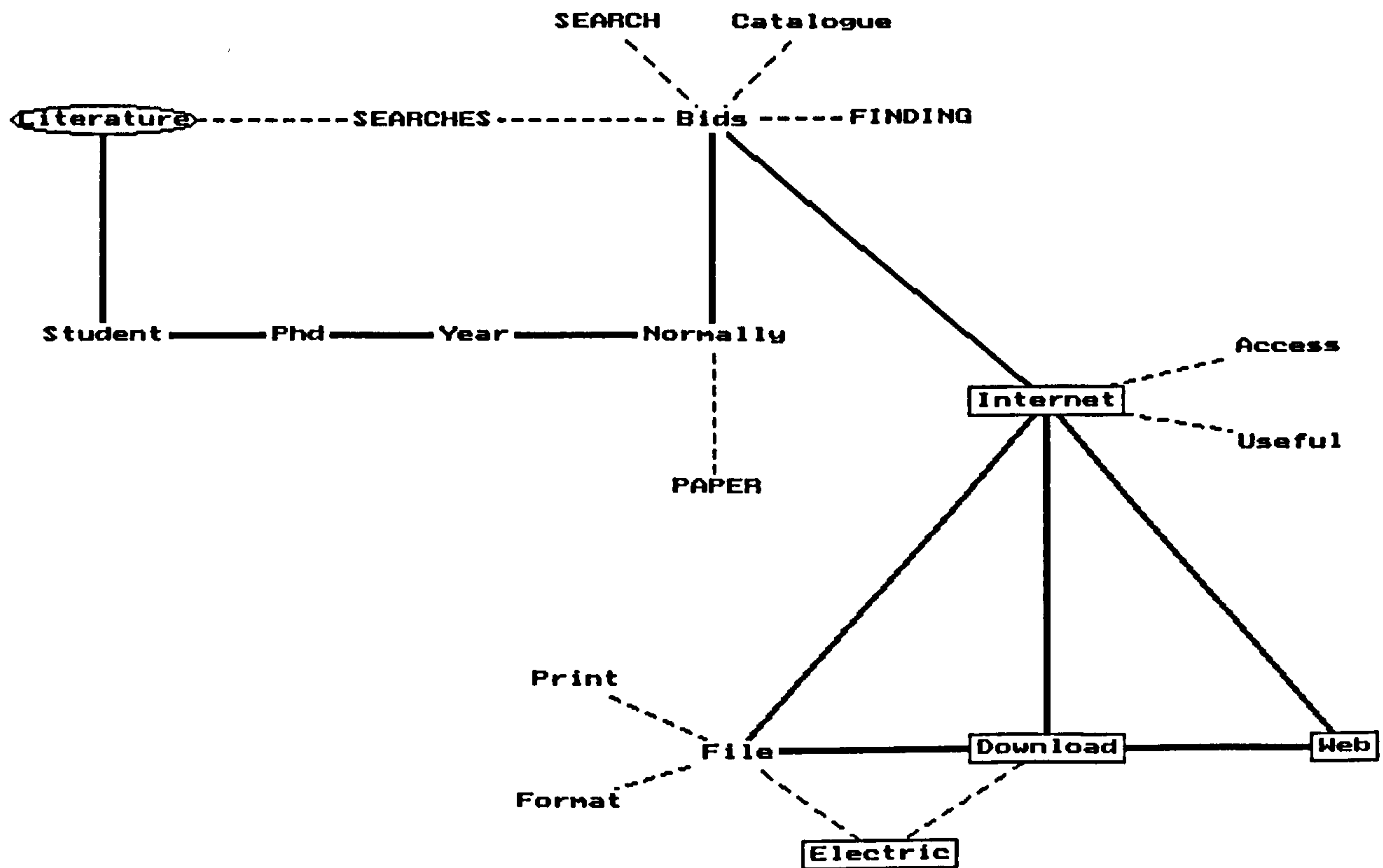
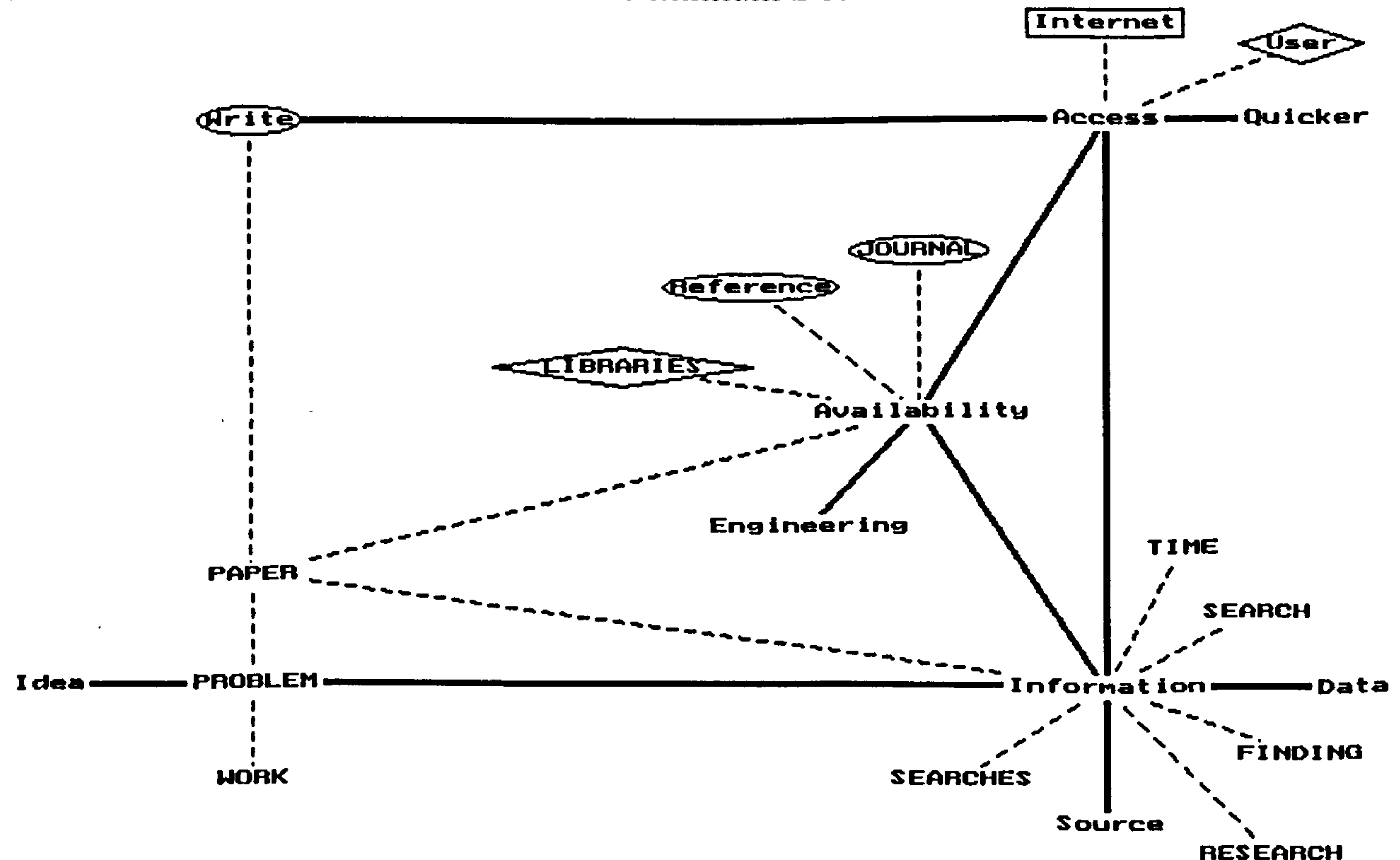


Figure 88: Manufacturing engineering interviews; benchmarking corpus - Leximappe G

Seed pair {Information-Access} S = 0.057

Minimum S for internal links = 0.017 Minimum S for external links = 0.025



If these leximappes are compared with the global network diagrams (Figures 79-81), it is apparent that Leximappe A (Figure 82) incorporates much of the main network from Figure 79, together with two of the dyads from that diagram, {Key-Word} and {Search-Searches}. The centrality of {Libraries-Journal} is maintained in Figure 82, and these words appear as external links to the central word of Leximappe B, 'Paper'. The inclusion diagram (Figure 81) suggested that 'Paper' and 'Libraries' were main poles in two actor-networks, so that it is not surprising to find them occupying central positions in Leximappes A and B, and being accompanied by words associated with them in Figures 80 and 81. Leximappe C links {Photocopied-Photocopies} with {Department-Paying}, which appeared as a dyad in Figure 80. Leximappes D and F contain the major clusters of technology words, and are based on dissociated clusters from Figure 80. Leximappe E contains a cluster of temporal words {Day-Hour-Week-Month}, which appear to be connected to both {Database-Reference-Catalogue} and to {ILL-Loan}. Leximappe G, which is wholly under the threshold of Figure 80, contains the suggestive sequence from 'Idea', through 'Problem' to {Information-Access}, and thence to 'Write' and 'Quicker'. This might be simply interpreted as representing researchers' descriptions of how they write papers more quickly when their own ideas are supplemented by access to scholarly information.

The relatively strong connection between 'Libraries' and {Photocopied-Photocopies} in this corpus, as noted in the discussion of Figure 79 above, is clarified in the leximappes. Leximappe C shows {Photocopied-Photocopies} strongly linked to {Department-Paying}, to 'Article' and, externally, to 'Libraries'. This perhaps gives an interpretation that the link between 'Libraries' and {Photocopied-Photocopies} is financial and also involves the researchers' own departments. This contrasts with, for example, the benchmarking interviews with geography researchers, wherein Figure 64 implied that the equivalent relation for those researchers was temporal and did not include their departments. It was also suggested in the discussion of Figure 79 that the {File-Download-Web} cluster was specific to the manufacturing engineering researchers. However, Figure 45 (relating to business researchers) and Figure 66 (relating to geography researchers) suggest that similar clusters were apparent in those corpora.

Finally in relation to Figure 79, the thesis that 'Journal' is more related to access than to retrieval words is not supported by the leximappe series, which suggests that 'Journal' is strongly linked to both. Given the two major networks identified, around 'Libraries' and 'Paper', it would be better to characterise 'Journals' as a key term in the former (Figure 82, Leximappe A), linking access and retrieval functions that are undertaken by {Looking-Abstract} and {Print-Screen} in Leximappe B (Figure 83). It is the clarity of this split between two information retrieval (location) and access paradigms that is the major distinctive feature of the benchmarking interviews with manufacturing engineering researchers when compared with those with business and geography researchers.

Synthesis

In considering the category words, scholarly communication, the information chain and technology, it appears that scholarly communication words are fairly well scattered throughout the leximappes, the linking information chain dyad is in Leximappe A, and technology words are in two main clusters (in Leximappes D and F). However, to gain a clearer impression of this distribution and of the relationship between the three categories, a synthesis diagram was again generated from the leximappes.

finding, it is difficult to define a boundary region between the categories scholarly communication and technology in the engineering benchmarking interviews.

The split suggested in the global network diagrams between the network based on 'Journal' and that based on 'Paper' is fairly evident in Figure 89 (although this is not the purpose of the diagram), corresponding broadly to a top-bottom split. The 'Journal' network is closely related to the information chain dyad {ILL-Libraries}. The other link between information chain and scholarly communication words at {Reference-Database} is related to both the 'Journal' and the 'Paper' network. The boundary between the information chain and scholarly communication is, therefore, complex. That between the information chain and technology is clearer, consisting of {Libraries-Computer} and, specifically to the manufacturing engineering benchmarking interviews, {PC-User-System}. This is the first time that 'User' has appeared in a synthesis diagram.

In summary, because the scholarly communication category is not found as a discrete entity in the manufacturing engineering benchmarking interviews, the boundaries between it and the other categories is somewhat ambiguous. That between the information chain and technology is clearer and, unlike other corpora, invokes the term 'User'.

9. Evaluation interviews with manufacturing engineering researchers

This section is concerned with the evaluation interviews with manufacturing engineering researchers. There were 23 such interviews. Once again, the results are given in the following order:

- Graphical estimation of the core words used most frequently;
- Global network showing the overall distribution of the words in the interviews according to the S (association) and the I (inclusion) indexes;
- Leximappes for the engineering evaluation interviews;
- Synthesis of leximappes to show 'scholarly communication', 'information chain' and 'technology' networks in relation to each other.

Graphical estimation of the core

The core of words for the engineering evaluation corpus was estimated graphically from the Bradford-like distribution of the prompt words for each corpus. The non-linear section of the graph included all words ranking above Log 2.9, which gave a core of words as follows:

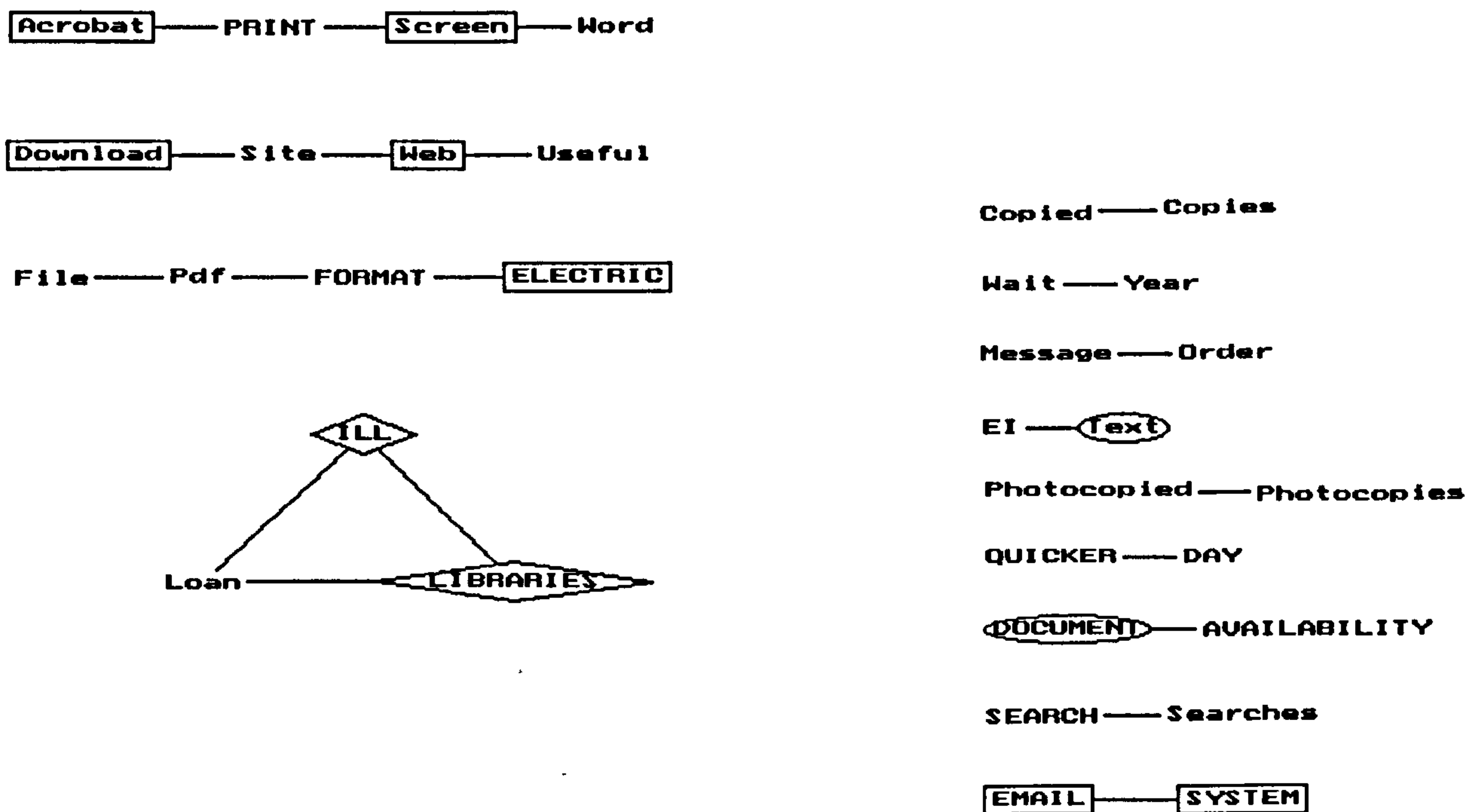
PAPER, DOCUMENT, TIME, PROBLEM, LIBRARIES, LOOKING, WORK, AVAILABILITY, ILL, SYSTEM, FINDING, READ, FORMAT, QUICKER, EI, JOURNAL, PRINT, ELECTRIC, SEARCH, DAY, EMAIL, RESEARCH.

Global network diagrams

The global association network diagram for the benchmarking interviews with manufacturing engineering researchers, is shown at two threshold values of the association index in Figures 90 and 91.

Figure 90: The global association network diagram from the evaluation interviews with manufacturing engineering researchers (1)

(threshold $S = 0.10$)



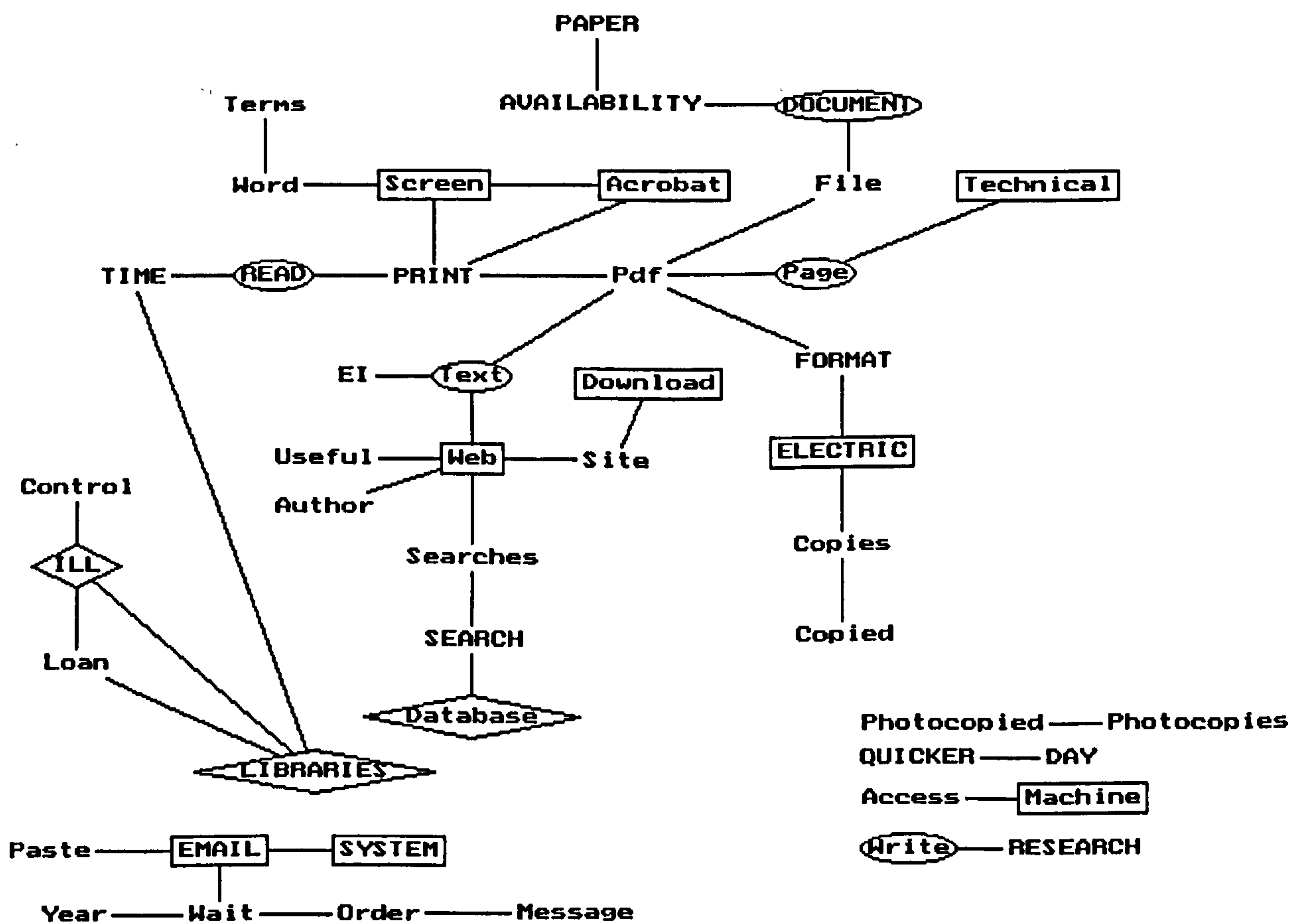
This diagram can be compared with the following:

- Figure 27, representing all the evaluation interviews;
- Figure 49, representing those for business researchers; and
- Figure 71, representing those for geography researchers.

Figure 90 shares very few features with these diagrams. There is no main network, but four dissociated clusters and a relatively large number of dyads. It should be noted that the electronic system being evaluated by the manufacturing engineering researchers was called 'EiText', which explains one of the dyads. There are very few scholarly communication words at this threshold level (excluding 'Text' there is only one), but many technology words. Despite other differences, the information chain remains represented by {ILL-Libraries}. Comparing Figure 90 with the equivalent diagram for the engineering benchmarking interviews (Figure 79), we can see more similarities than with other benchmarking corpora. The {ILL-Loan-Libraries} cluster is common, as is a cluster including {Web-Download}. However, Figure 90 includes more technology

words than any other equivalent diagram, including Figure 79. If we increase the detail by decreasing the threshold value, we get Figure 91. Again, I have tried in Figure 91 to maintain as much of the layout of previous global association diagrams as is possible, especially Figure 90 so that it is clear how Figure 91 has grown from Figure 90.

Figure 91: The global association network diagram from the evaluation interviews with manufacturing engineering researchers (2)
(threshold $S = 0.08$)

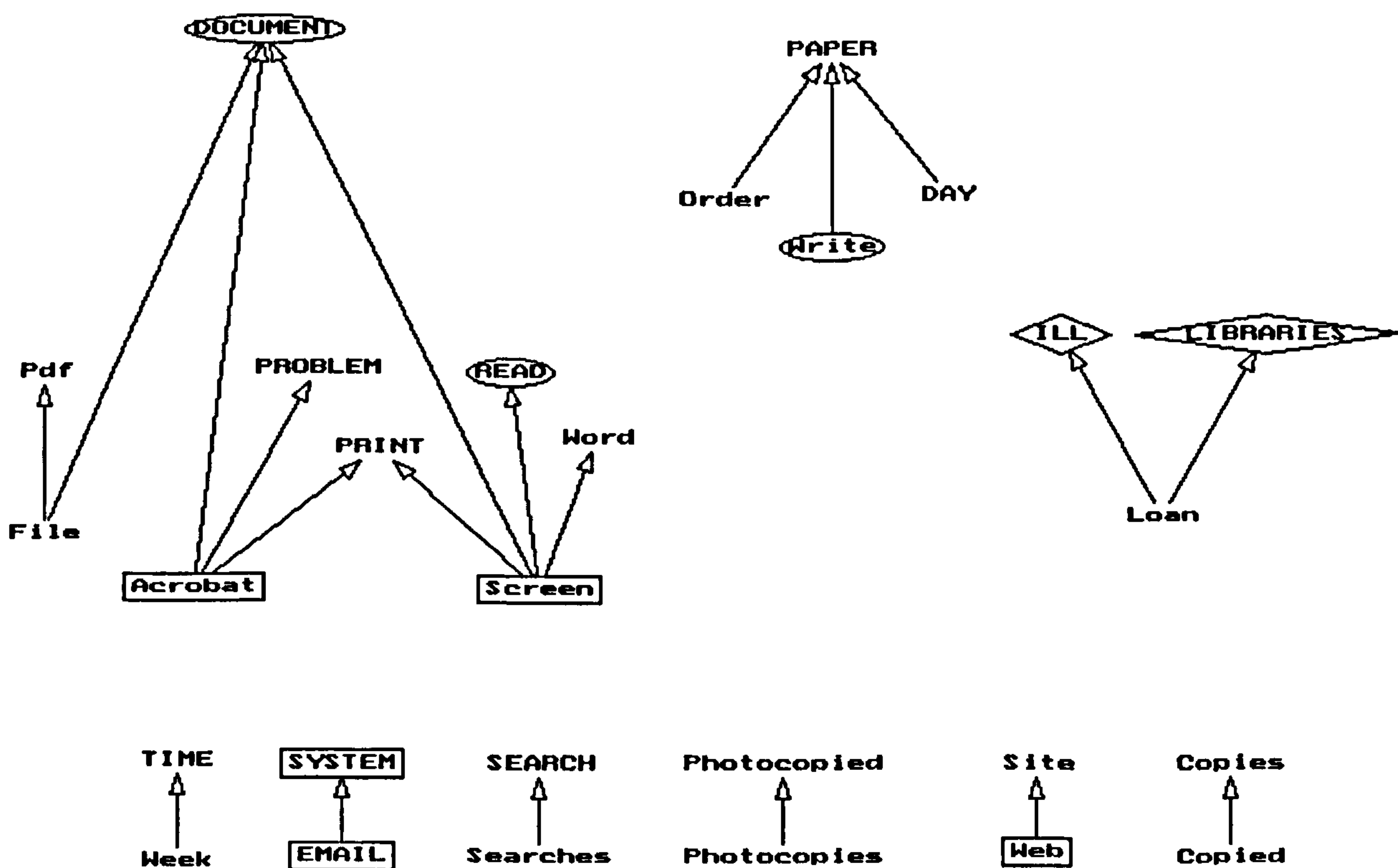


At this threshold level of the association index, $S=0.08$, the diagram shows even more technology words plus one or two more scholarly communication words, but these latter are peripheral. Furthermore, several words in the diagram, for example 'Pdf' (which is a computer file format) could easily have been included in the category of technology, but were not because they were insufficiently common in the interview corpus as a whole. Unlike previous such diagrams (Figures 28, 50 and 72), 'Journal' is completely absent

from Figure 91. Even 'Paper', which seemed to be an alternative in other corpora (for example, the benchmarking interviews with manufacturing engineers, Figure 80), is marginal in Figure 91. It would appear that technological artefacts and processes are wholly dominant in the evaluation interviews with manufacturing engineering researchers, compared with previous interviews. The small dissociated network centred on {Email-Wait} almost certainly represents one aspect of the operation of EiText.

Again, an inclusion network diagram was generated to give a second overall view of the data.

Figure 92: The global inclusion network diagram from the evaluation interviews with manufacturing engineering researchers (threshold I = 0.5)



Again, Figure 92 differs from previous inclusion diagrams representing evaluation. The major poles of Figure 51 (business evaluation interviews) were 'Journal' and, to a lesser extent, 'Libraries'. In Figure 73 (geography evaluation interviews), they were 'Journal',

'Paper' and 'Search', which suggested that recognisably library-oriented activity was still important. In Figure 92, however, they are 'Document' and 'Paper'. Comparing Figure 92 and Figure 91, it is clear that 'Document' is the more central to the network.

Although 'Document' is defined as a scholarly communication word, it is not linked to 'Libraries' or to the scholarly communication words usually associated with it such as 'Journal' and 'Article'.

The leximappe procedure was again used to investigate further the detail of the networks representing the evaluation interviews with manufacturing engineering researchers. As with the geography evaluation corpus, there were insufficient different words available in the engineering evaluation corpus to complete seven leximappes. The six complete leximappes possible are shown here; the remaining eight words in the corpus formed small, wholly dissociated and weakly related fragments.

Leximappes

Figure 93: Manufacturing engineering interviews; evaluation corpus - Leximappe

A

Seed pair {Copies-Copied} S = 0.91

Minimum S for internal links = 0.082 Minimum S for external links = 0.060

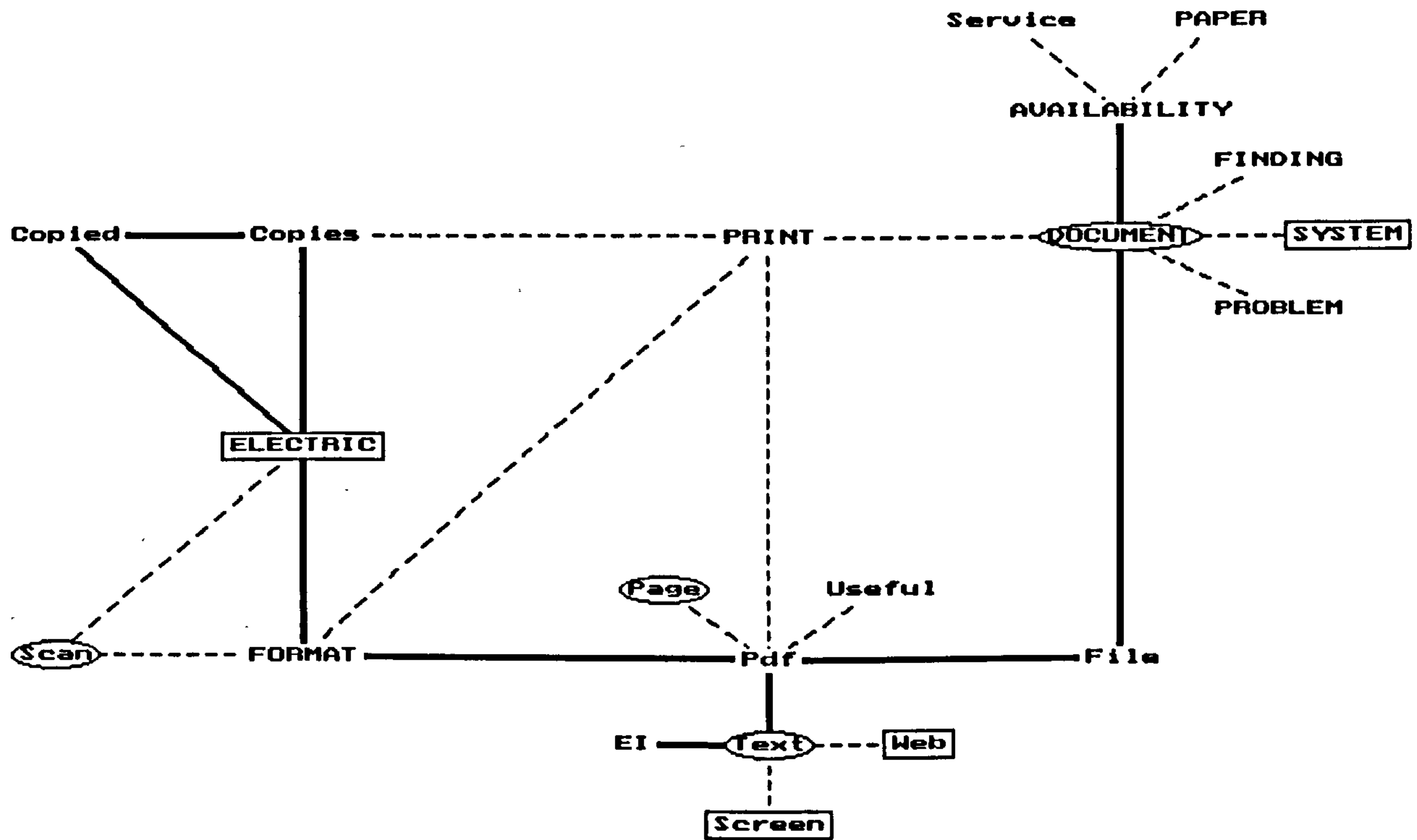


Figure 96: Manufacturing engineering interviews; evaluation corpus - Leximappe D

Seed pair {System-Email} S = 0.18

Minimum S for internal links = 0.058 Minimum S for external links = 0.050

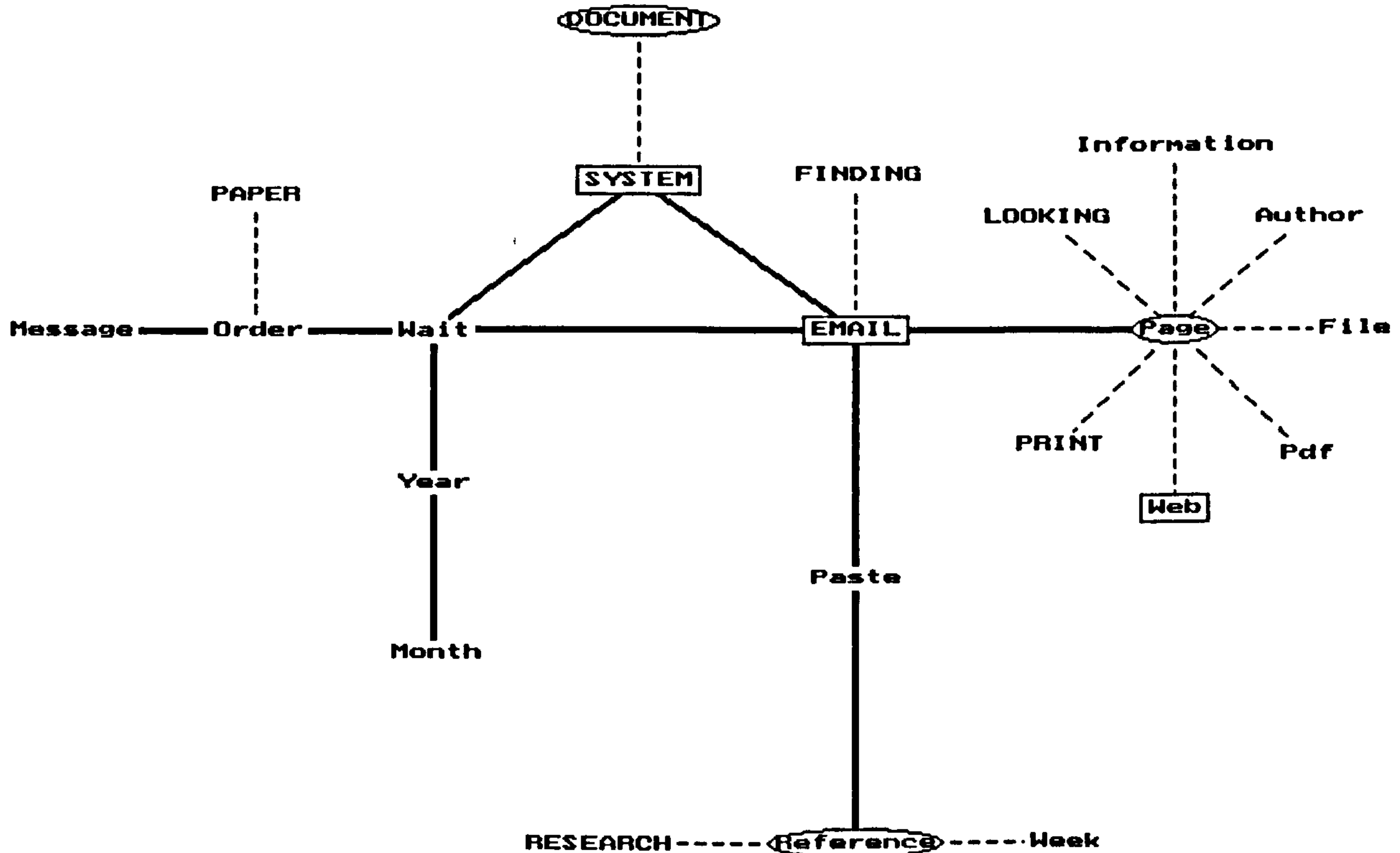


Figure 97: Manufacturing engineering interviews; evaluation corpus - Leximappe E

Seed pair {Word-Screen} S = 0.18

Minimum S for internal links = 0.040 Minimum S for external links = 0.040

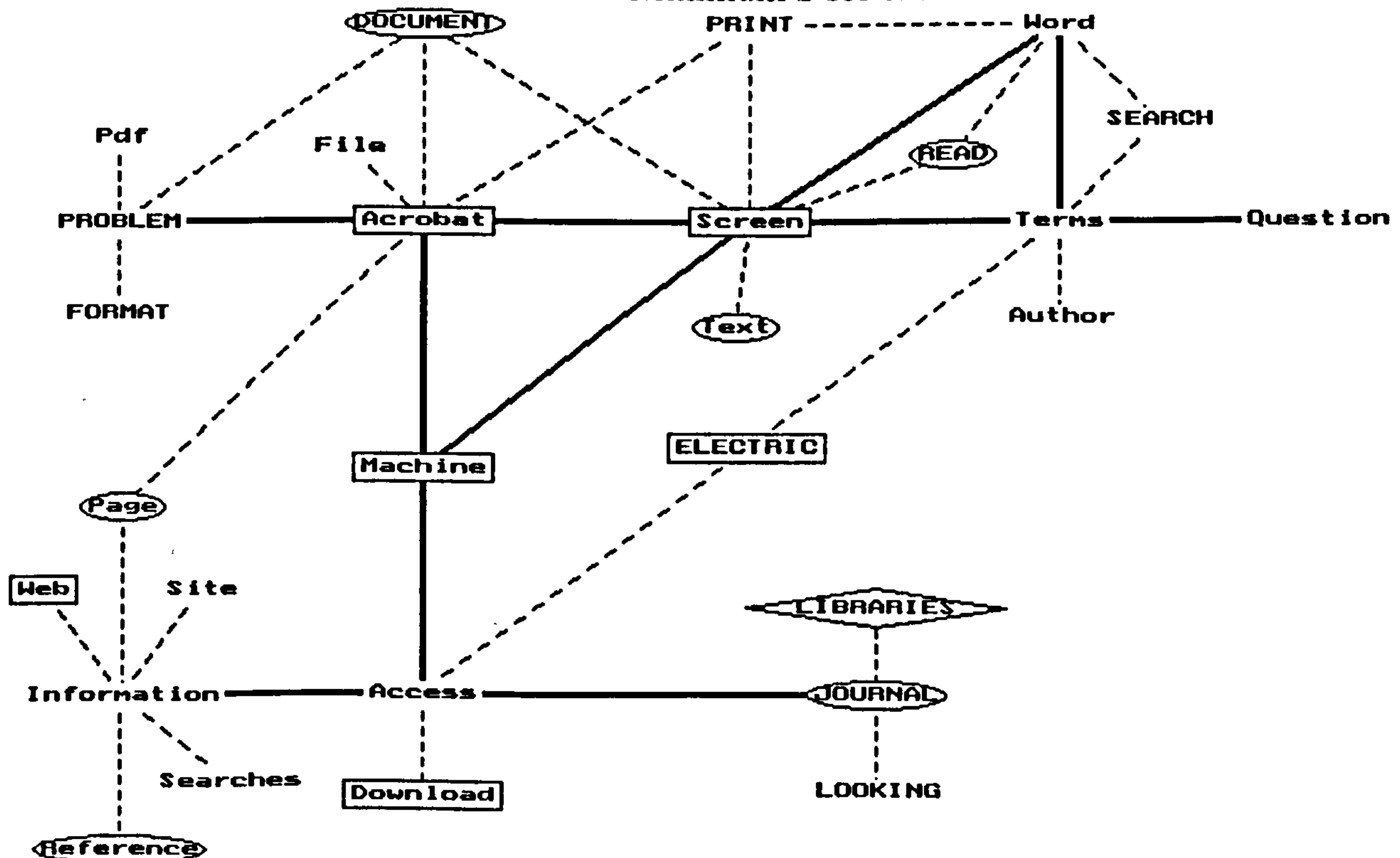
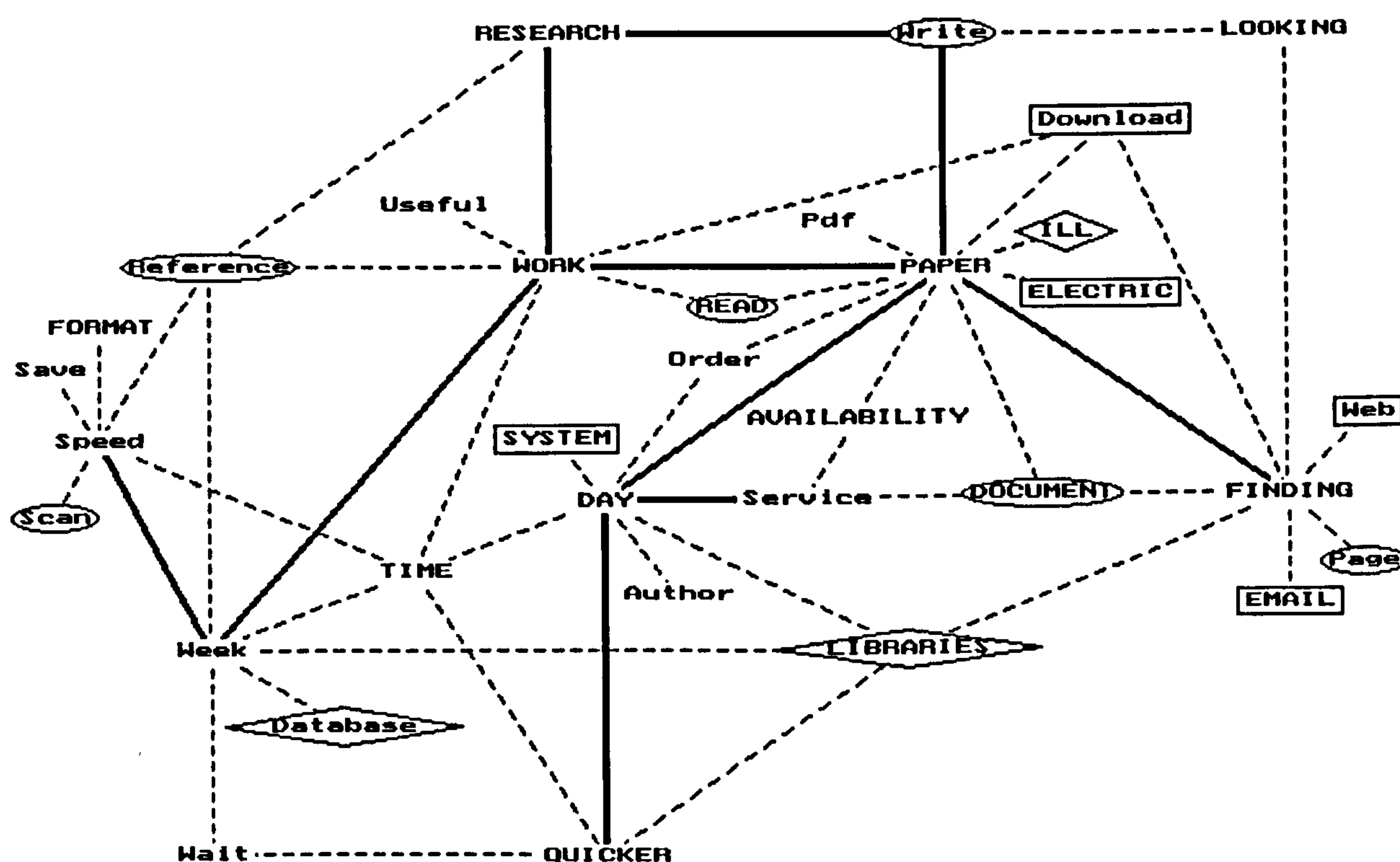


Figure 98: Manufacturing engineering interviews; evaluation corpus - Leximappe F
 Seed pair {Quicker-Day} S = 0.13
 Minimum S for internal links = 0.045 Minimum S for external links = 0.040



Comparing these leximappes with the global network diagrams it is apparent that Leximappe A consists of right-hand edge of the main network in Figure 91, excluding {Technical-Page} but including {Ei-Text} which, as has been noted, certainly refers to the electronic system being evaluated. Leximappe B focuses on the central portion of Figure 91, while Leximappe C links the left-hand edge of the main network with the {Photocopies-Photocopied} dyad. Leximappe E comprises the smaller network from Figure 91, based on {Email-Wait}, and links this with 'Page', which is clearly an important linking concept because of its many external links in Leximappe E (Figure 97) and because Figure 96 suggests that 'Page' links the {Email-Wait} network to the main network in Figure 91. Leximappe E includes the top-left region of the main network from Figure 91 plus the {Access-Machine} dyad, while the perhaps over-complex Leximappe F links the two dyads {Quicker-Day} and {Write-Research}.

The scholarly communication words in this series of leximappes are less frequent than in previous series, but they also form a rather different subset of the category. For example,

in the leximappes for the business evaluation interviews (Figures 52-58), scholarly communication words included (in order of appearance):

- ‘Journal’, ‘Reference’, ‘Abstract’, ‘Article’, ‘Read’, ‘Book’, ‘Page’ and ‘Text’

In the leximappes for the engineering evaluation interviews above, scholarly communication words included (again, in order of appearance):

- ‘Text’, ‘Document’, ‘Read’, ‘Scan’, ‘Reference’, ‘Page’, ‘Journal’, ‘Write’

The shift from ‘Abstract’, ‘Article’ and ‘Book’ to ‘Scan’, ‘Document’ and ‘Write’ suggests that even when manufacturing engineering researchers were referring to scholarly communication, they were referring to a somewhat different thing than were business researchers. In particular, the shift from nouns to verbs may suggest a more interactive approach to scholarly communication. This finding is in line with much other research (Meadows 1998) that has concluded that there are disciplinary differences in information and communication behaviour. However, because the benchmarking interviews with manufacturing engineering researchers appeared to be relatively conventional (using both ‘Abstract’ and ‘Article’), we might conclude that these disciplinary differences are affected by other matters. These matters might, for example, relate to the much increased deployment of technology words in the manufacturing engineering evaluation interviews compared with other corpora.

Synthesis

A synthesis diagram was generated to investigate the category of scholarly communication as used by manufacturing engineering researchers and its relation to the category of technology. The leximappes seemed to confirm the importance of the latter in comparison with previous interview corpora.

Figure 99: Manufacturing engineering interviews; evaluation corpus - Synthesis diagram

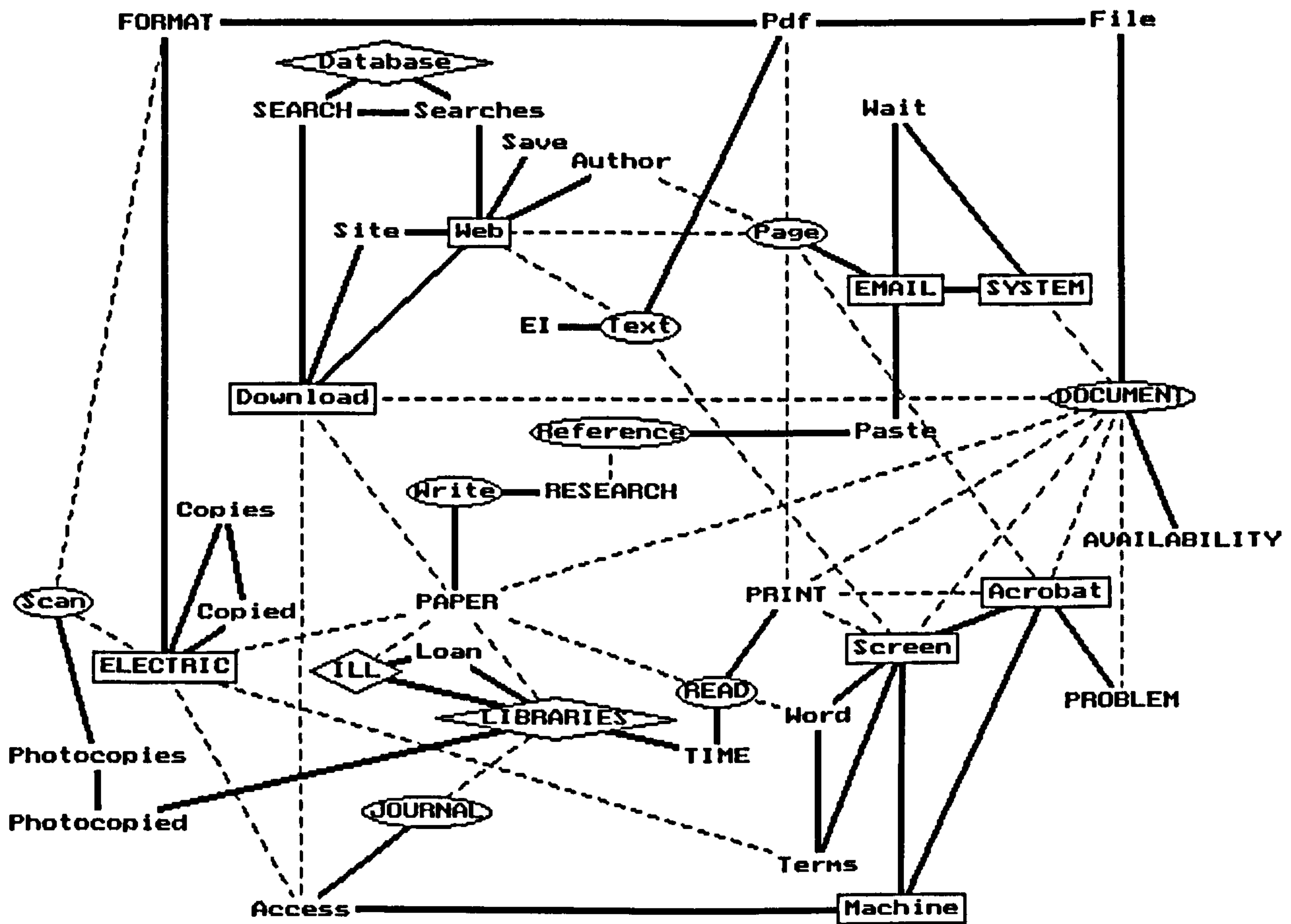


Figure 99 shows that it is difficult to see the scholarly communication words used in the engineering evaluation interviews as a discrete category. Rather, these words are scattered throughout the diagram among technology words, which themselves form a number of clusters identifiable from the leximapps. For example, there is {Acrobat-Screen-Machine} from Leximappe E. Because of this structure, a boundary region between the two categories of words is not readily identifiable. Instead, it may be better to characterise the relation between the two categories in terms of a number of interfaces associated with redefined scholarly communication words such as 'Document'.

'Document' in Figure 99 occupies a position analogous to that of {Journal-Paper} in Figure 89 (representing the benchmarking interviews), and is linked to 'Availability', 'Problem', 'Acrobat', 'Screen', 'Print', 'Paper', 'Download', 'System' and 'File'. This is in contrast to Figure 89, in which 'Document' was linked to only 'Electric', 'Reference'

and 'Time'. Given that the principle of co-word analysis is that a word's meaning is how (where) it is used and its use is represented by its position in the co-word network, then it is clear that the meaning of 'Document' has not only changed but expanded from the benchmarking to the evaluation interviews with manufacturing engineering researchers. In contrast to the major changes in other categories, the information chain remains represented in a way similar to most previous synthesis diagrams, with {ILL-Libraries} linked to 'Journal' and separate from 'Database'. It is the latter that provides the closest link to technology, at {Download-Web}.

In summary, scholarly communication seems both a different and less discrete category in this interview corpus than in others and the key artefact is not, as in previous corpora, either 'Journal' or 'Paper'; it is 'Document'.

Summary and concluding remarks

Taking an actor-network view of language use in interviews has allowed for the close analysis of precisely what semantic clusters are important (common) in the interviews with academic researchers, how these clusters are related to each other, and if and where the categories of formal scholarly communication, the academic information chain and technology fit in to these networks. That is, it enabled the production of empirically generated experimental fields specific to a number of interview corpora, and the mapping of particular categorical definitions onto those fields.

Taking the interviews as a whole, scholarly communication words such as 'Journal', 'Article' and 'Abstract' were central and formed a relatively discrete category that mapped well onto the empirically generated networks. Technology, on the other hand, existed only as dissociated clusters or idiomatic dyads. The information chain word 'Libraries' was closely related to the scholarly communication cluster but not to the various parts of 'technology'.

However, within this interview corpus there are major differences. Evaluation interviews tended to be represented by less centralised networks than benchmarking interviews. In terms of the actor-network, this implies that the relatively punctuated, or black-boxed, networks in the benchmarking interviews were broken apart to some extent in the evaluation interviews. That these networks were related respectively to aspects of the scholarly communication, information chain and technology categories suggests that these were in some way relevant to the shift. In particular, there was a decrease in the centrality of 'Libraries' in the evaluation interviews; although the major centre of translation in benchmarking interviews, it was challenged in evaluation interviews by 'Journal'. Among geography researchers 'Paper' was also important, and among manufacturing engineering researchers it was 'Document'. There were other subject-related differences. For example, business researchers were perhaps most typical and manufacturing engineering researchers least typical when comparing with the interviews

as a whole. It should be noted at this point that this notion of typicality is somewhat compromised by the fact that there were many more interviews with business researchers, so that the business interview corpus contributed disproportionately to the interview corpus as a whole. However, the subject-specific corpora could be validly compared with each other, and such comparisons revealed many interesting findings. For example, photocopying appears to vary in significance between subject areas. Business researchers talked of it in relation to financial issues, as did manufacturing engineering researchers. These financial issues were also related to the word 'Department'. However, geography researchers talked of photocopying in terms of temporal issues, of time and queues.

In terms of the categories of scholarly communication, the information chain and technology, scholarly communication words were common and formed a relatively discrete cluster in benchmarking interviews with business researchers. This cluster was less clear in benchmarking interviews with researchers in the other subject areas, whereas technology words were more apparent. However, these latter were in dissociated clusters and could not be said to form a focus in the way that scholarly communication words did in the business benchmarking corpus. The representation of the information chain category remained remarkably consistent across subject areas, but became more isolated as 'Libraries' lost its central position. It can be proposed, then, that business researchers in the benchmarking interviews talked of a world dominated by journals, articles and libraries, which can be termed the 'library' model. This was commonly associated with temporal concerns, especially when referring to interlibrary loans. Technology was peripheral to this model. In contrast, for other researchers, notably manufacturing engineers, this 'library' model was supplemented by other networks based around 'Paper'. The 'paper' model was more integrated with technology words, especially via a common cluster {Screen-Print-Read}. However, in the evaluation interviews with manufacturing engineering researchers, even this model was superseded by one based on 'Document'. The 'document' model included a somewhat different, perhaps more interactive, set of scholarly communication words to that in the 'library' model, and was thoroughly integrated with various clusters of technology words.

Chapter Six: Discourse analysis of interviews with researchers

Introduction

The principles and background of the discourse analysis methodology have been described in Chapter Two. This section is concerned, firstly, with describing the practicalities of the particular analyses undertaken and, secondly, with presenting those analyses.

The topics

The topics of this section, in common with other empirical sections of this study, are formal scholarly communication, the academic information chain and machinic technology. These have been provisionally defined in Chapter One. Scholarly communication was understood as involving such things as articles, journals, and processes such as being informed and keeping up to date with the latest research. The information chain was identified by references to such entities as libraries, document suppliers and publishers. Technology was taken to refer to artefacts (such as computers) and practices (such as email) that were commonly thought of as technological at the time of the fieldwork. In terms of a discourse analytic perspective, I took these definitions as a reference against which particular data could be assessed in terms of their relevance to the topics. However, the definitions were kept open and I was prepared to react to what I found in the data. I was interested in how these ideas were used by researchers who were, to a greater or lesser extent, engaged in practices relevant to all three. In particular, how were the three topics used by researchers to undertake interactional business in the interview, to position themselves and so on? How were the boundaries between the three topics managed, and what else did this management achieve? It is important to note that the analysis is concerned more with what happened during the interviews than with the content of interviewees' responses to questions.

Given that the interviews were with academic researchers, it was anticipated (and turned out to be the case) that scholarly communication and technology were much more visible topics than the information chain.

The analyses

The three discourse analytic themes described in Chapter Two were interpretative repertoires, subjectivity and deixis, and interests. Interpretative repertoires were understood to cover a range of linguistic resources and practices that would only become apparent via analyses of a number of transcripts or excerpts. As a result, no one particular section of analysis was geared to looking at repertoires. Instead, their existence and deployment was considered in terms of the other two analytic foci, subjectivity / deixis and interests. As described above, the former focused initially on instances of the words ‘I’, ‘we’ and ‘you’. The latter focused on interest management practices in the interviews, particularly the stake management relating to researchers’ potentially problematic accounts of the effect of improved document access on their research. Hence, two sets of analyses are presented, one on subjectivity / deixis and one on interests. Each set of analyses is broken down in two ways, firstly according to the subject area of the interviewees and secondly according to which of the two interviews (benchmarking or system evaluation) the data is taken from. Thus, each of the two sets analyses – subjectivity / deixis and interests – has a 2*3 matrix structure as shown in Table 5:

Table 5: The structure of the analyses in Chapter Six

Subject area →	Business	Geography	Manufacturing Engineering
Interview ↓			
Benchmarking	S.1 / I.1	S.2 / I.2	S.3 / I.3
Evaluation	S.4 / I.4	S.5 / I.5	S.6 / I.6

Numbers in each cell refer to the section numbers in the following analyses (S = Subjectivity / deixis; I = Interests).

Deixis and subjectivity in the interviews with researchers

Background

Deixis, or indexicality, is a concept widely used by ethnomethodologists, relating broadly to self-reference. Subjectivity has been employed in post-structuralist writings to denote the positioning or interpellation of individuals so as to staff discursive roles. Potentially, then, these two ideas might be related in particular instances of practice such as the interviews that form the data for this thesis. As suggested in Chapter Two, empirical work on this topic will focus on instances of the words ‘I’, ‘we’ and ‘you’ in the interviews. As noted in Chapter One, I explicitly acknowledge an interest in how the concepts of technology, the information chain and scholarly communication were deployed during the interviews and I suspected there to be lexical registers and repertoires apparent in this deployment, along with boundary management issues between them.

The reader is referred to the interview schedules in Appendix A throughout this section. In all interviews, the interviewer was the author.

Locating the subjective actor

Looking at the interviews, we can see (empirically) that the interviewees deployed two pronoun families denoting personal deixis / subjectivity:

- (i) first person singular – ‘I’, ‘me’, ‘my’;
- (ii) first person plural – ‘we’, ‘us’, ‘our’;

A third pronoun family was used to denote interesting issues of transitivity / subjectivity:

(iii) second person – ‘you’, ‘your’.

However, as we shall see, the first person plural was used very much less than the other two markers of subjectivity.

The analyses in this section, then, relate to these three pronoun families. They in no way exhaust the ways in which personal deixis, transitivity and subjectivity were deployed and, furthermore, not all such markers did represent instances of subjectivity – this was an empirical question. However, they are taken here as being the main subjectivity markers as a review of the interview transcripts suggested that this was the case.

Examples from the transcripts of each of the pronoun families were:

1. “So what I feel, at the time, I feel I would have time to do more admin.”
2. “We’re under such pressure with teaching and administration that where research should be a central part of what we do, it is a central part, it tends to get pushed off the edge by more immediate pressures...”
3. “Well, because you are using the time more efficiently and I think your mind can be a bit more focused than when you are waiting two to three months for a particular document to analyse it.”

These excerpts (1-3) offer examples of subjectivity that appear to have a lot in common with each other. For example, the first ‘you’ in Excerpt 3 appears to be doing very similar work to the third ‘I’ in Excerpt 1. However, there are other examples that appear to show distinct types of subjectivity, for example the first ‘I’ in Excerpt 1. These examples are only suggestive, because they are too short and do not contain sufficient data to be confident in the interpretations being put on them. Nevertheless, they do suggest that analysis in terms of the three sets of subjectivity marker words might be fruitful.

The objectives of the analysis were, firstly, to identify ways in which participants interactively used ‘I’, ‘we’ and ‘you’ during the interviews, secondly to identify the tasks

in which participants were engaged in these usages and, thirdly, to identify the other resources used in these interactive tasks. Appearances of these words in the interviews were taken to be the population of utterance events that could be analysed. In the 158 interviews described in Chapter Four, the frequencies of the three pronoun families were as shown in Tables 6 and 7:

Table 6: Frequencies of the subjectivity marker pronoun families in the interviews with academic researchers

Word-family	Business	Geography	Manufacturing Engineering	Totals
All words	173,056	42,934	103,408	319,398
First person singular (e.g., 'I')	7,592	1436	3934	12,962
First person plural (e.g., 'we')	446	278	294	1,018
Second person (e.g., 'you')	5,308	1314	3569	10,191
Totals	13,346	3,028	7,797	24,171

Table 7: Frequencies of the subjectivity marker pronoun families in the relevant sections of the interviews with academic researchers (Questions B.13. and E.14)

Word-family	Business	Geography	Manufacturing Engineering	Totals
All words	15,563	3,559	10,798	29,920
First person singular (e.g., 'I')	529	119	399	1,047
First person plural (e.g., 'we')	33	23	12	68
Second person (e.g., 'you')	522	109	353	984
Totals	1,084	251	764	2,099

Analysis was restricted to Questions B.13 and E.14 (see Chapter Four and Appendix A). The degree to which these were representative of the whole corpus in terms of the frequency of use of the subjectivity marker pronoun families can be shown in a third table, Table 8, in which the values in Table 7 are shown as a percentage of those in Table 6.

Table 8: Frequencies of the subjectivity marker pronoun families in Questions B.13. and E.14 as a percentage of their frequencies in the whole corpus

Word-family	Business	Geography	Manufacturing Engineering	Totals
All words	8.99	8.29	10.44	9.37
First person singular (e.g., 'I')	6.97	8.29	10.14	8.08
First person plural (e.g., 'we')	7.4	8.27	4.08	6.68
Second person (e.g., 'you')	9.83	8.3	9.89	9.66
Totals	8.12	8.29	9.8	8.68

The comparison shows that, in terms of relative frequency of use of the marker words being used to focus the analysis, the interactions relating to Questions B.13 and E.14 were broadly similar to those making up the rest of the interview corpus. The most notable of any possible exceptions to this might be the use of 'I' in interviews with researchers in business departments, although this is part of a generally lower frequency of subjectivity pronouns in these sections of interviews with researchers from business departments.

Because of the infrequency with which the first person plural ('we') was used across all three departments, I decided to restrict specific analyses to focus on 'I' and 'you', and to include consideration of 'we' only in an *ad hoc* manner where it appeared during these other analyses.

As noted above, as well as dividing the analysis according to the interviewee's academic department and according to the two subjectivity marker words, I shall also divide the analysis according to whether the interview in question was a benchmarking exercise or an evaluation exercise. That is, what follows is divided according to whether Question B.13 or Question E.14 was relevant (see Appendix A). Analysis proceeded by identifying, from the relevant excerpts of transcript, passages that seemed on first inspection to include a rich and broadly representative array of instances of uses of the pronoun family in question.

S.1. Business departments, benchmarking interview

Table 8 indicates that the first person singular is relatively infrequent in the interactions around Question B.13 (and E.14) compared to the rest of the interviews with researchers from business departments. However, since most such interactions use a combination of first and second person forms then this small effect is probably of little consequence.

First person singular – ‘I’

Somewhat less than a third of the interviewees used the first person singular as the overwhelming voice to answer Question B.13. I shall analyse an example, which is in some ways thematically typical.

Excerpt 4:

- [1] Interviewer: If you could have instant access to any document
[2] would that make a difference to the quantity and quality of your research?
[3] Interviewee: It would make a difference to the quality
[4] My problems are academic because I produce too much in terms of quantity
[5] my research necessitates this kind of thing
[6] therefore I am tempted to skip on quality
[7] Instant access would actually enable me to plug the gaps and I would be able to produce what I do better
[8] but would not be tempted to produce more of it because I couldn't anyway
[9] If that makes sense
[10] Interviewer: Yes
[11] Interviewee: I would add to this that because of the riders to that question
[12] I make quite a lot of use of research assistants for basic IT searches
[13] because that is the one area that I can quite happily delegate

In utterances [1]-[2] the interviewer initiates the interaction with the interview question as stated in the schedule. The interviewee's first response in [3], which does not include any indication of subjectivity, is to pick one of the two options offered in the question ('quality'). In utterances [4]-[5] the interviewee begins her account of this first response. Both the sequential and distal (Zimmerman 1998) contexts of this excerpt suggest that the interviewee begins as a member of the category 'competent researcher', with associated entitlements to speak as such. That is, she can rely on her membership of this category for all current practical purposes to allow her to make certain kinds of statement, without having to account for how it is that she has the requisite knowledge to do so. Working from this assumption, she picks up on the possessive 'your research' in [2] as a confirmation of this entitlement, and goes on to characterise 'my' research as balanced in favour of quantity rather than quality. This is a potentially risky assertion for a senior academic researcher (that seniority is an issue will become apparent in the way she deals with the problematic inferences available from the assertion). For an academic researcher to both claim ownership of research and to admit that the quality of this research is not what it might be is to risk being seen as incompetent; how does she manage this potential inference? Firstly, the balance is described as 'too much / not enough', rather than 'enough / not enough' (utterances [4] and [6]): she is working at full capacity and there can be no inference that quality improvements are possible within current constraints (utterance [8]). This is part of the construction of 'I' as a competent researcher. Secondly, in utterance [5] the emphasis on quantity rather than quality is described as not a matter of choice; the research 'necessitates' it. This is a version of the 'empirical repertoire' (Gilbert and Mulkay 1984), in particular that agency is virtually being attributed to circumstances, leaving the researcher ('I') as subject to its effects. Thirdly, and invoking the interviewee's seniority, in utterances [12]-[13] she challenges the basis of the interview question by attributing the relevant accountability to others ('research assistants'). The interviewee has, therefore, rendered an account appropriate to her role as an interviewee (she has answered a question that implied ownership of research) while avoiding potential negative inferences by delegating agency to her research and accountability to her research assistants. Note also how this has had the effect of associating 'I' with scholarly communication (what is 'produced' in [4] and [8])

while distancing 'I' from technology in utterance [12]. The information chain is not explicitly mentioned.

The conditional with which the excerpt begins is not explicitly addressed until utterance [7], by which time the interviewee has constructed a context in which she can answer the question relatively risk-free (see above). However, throughout the excerpt, much work has been required for the interviewee to maintain 'I' as both an accountable interviewee and a credible researcher. Perhaps it was for this reason that rather more interviewees from business departments included other subjectivity words besides 'I' in their responses to Question B.13.

Second person – 'you'

Interactions in which the second person was the interviewee's principal voice were even less common than those in which 'I' was dominant. Most interactions used a combination of both (see below). However, it is worth briefly looking at how 'you' was deployed more or less independently of 'I'.

Excerpt 5:

- [1] Interviewer: If you could have instant access to any document
[2] would that make a difference to the quantity or quality of your
 research?
[3] Interviewee It could do
[4] It could do if time was available to make use of that access
[5] But access is only part of the jigsaw puzzle
[6] Interviewer: In what way would it improve the quantity?
[7] Interviewee: Well if you can gain access reasonably speedily
[8] you can move from thinking about writing something to actually
 drafting it
[9] Because if time is a scarce resource anyway

- [10] then every three hours that you use searching for something or driving to Nottingham or whatever is time that you could have spent physically writing
- [11] Interviewer: And how might it improve the quality?
- [12] Interviewee: I think it wouldn't necessarily improve the quality
- [13] but it would increase the volume

Again, utterances [1]-[2] consist of the interviewer reading the interview question and the initial response in [3] is provisional and anticipates an account. A complex account is offered in [4]-[5], which does not involve any explicit subjectivity, but which is not accepted by the interviewer as an adequate answer. In utterance [6] the first of the two options in the interview question is reprised. This offer is accepted in [7], where the interviewee starts an account supporting it, an account that uses 'you' as the relevant actor. 'You' is available for this role, whereas it is not available at [4]-[5], perhaps because utterance [6] does not use 'you' in the way that [1]-[2] does. It serves to answer the challenge of [6], firstly by offering a syntactically straightforward way to enhance the account that has not been accepted as adequate by setting up a conditional scenario and, secondly, as a way of implicitly enrolling 'anyone' (including the interviewer) into that scenario or account (Sacks 1992). That this account is heard as adequate is shown by the interviewer in [11] moving on to the second of the two options in the interview question ('quality'). As noted in relation to Excerpt 4, this second option holds potentially negative inferences for a researcher, and it is dismissed in utterance [12], the interviewee explicitly invoking her position as an interviewee ('I') to do so. That is, as well as working with an assumed membership of the category 'competent researcher', the interviewee is also accountable as an 'interviewee', or someone both entitled and obliged to offer answers to interview questions.

In utterance [8], scholarly communication ('actually drafting it') is cited as the reason for speedy access, an emphasis that is echoed in [10] ('physically writing'). A hierarchy is being established here, with such scholarly communication activities at the top and activities such as 'thinking about writing something' (utterance [8]) and 'searching for

something' (utterance [10]) at the bottom. Time-savings would shift anyone's focus onto doing more of the former and less of the latter – the interviewee's use of 'you' in the account makes this natural and something that anyone would do. However, time might as easily be spent by anyone in improving the quality rather than the quantity of research, as suggested in [11]. 'You' has already worked to set up the hierarchy in terms of quantity and it is also available for similar work with regard to quality, which is perhaps why the interviewee switches to 'I' in utterance [12], to prevent this. Furthermore, 'I' asserts the interviewee role in the face of what might be heard in [11] as another challenge to the adequacy of the previous account.

The tactic of splitting a topic that is momentarily discursively problematic, in this case the practices of research in utterance [8], was common in the interviews. In this case, it is possible to argue that this boundary management protects the 'scholarly' from inferences relating to time, to "driving to Nottingham" [10] and, by implication, to library arrangements. Thus, the interviewee is using the scholarly communication / information chain boundary to protect her subject position as researcher in the interview.

There are clearly difficulties in working with just one subjectivity word, whether 'I' or 'you', and two thirds of the interviewees used a mixture of both.

Both first and second person – 'I' and 'you' (and 'we')

We saw, above, how interviewees using predominantly one or other of 'I' and 'you' had difficulties in rendering accounts that maintained the speaker as both accountable interviewee and credible researcher. Most used both words in their accounts, and some also used 'we'. I shall review an excerpt that uses all three of these words.

Excerpt 6:

- [1] Interviewer: If you could have instant access to any document
[2] Would that make a difference to the quantity or quality of your research work?
- [3] Interviewee: Yes I think it would
[4] We're under such pressure with teaching and administration that where research should be a central part of what we do
[5] it is a central part
[6] it tends to get pushed off the edge by more immediate pressures
[7] And what we really want to do is
[8] if you do get an afternoon or a morning where you do get a bit of space
[9] Its very important in terms of productivity and motivation to go up and get instant access to the material
- [10] Interviewer: So that would improve the quantity?
- [11] Interviewee: I think it would make me more productive, yeah
[12] In terms of quality I think its more questionable
[13] But in terms of quantity and efficient turnaround I think it would definitely help
[14] And I suspect I'm like quite a few academics that I've had a few articles rejected
[15] And the journals say 'if you do this, this and this then we will look again at it'
[16] These things just gather dust for months
[17] And when you do get a chance of a day or two to pick them up
[18] What you really need to do is blast straight into them
[19] But the time pressure's taking over

As usual, utterances [1]-[2] consist of the interviewer reading Question B.13 from the schedule. Like Excerpt 5, the initial response is a brief positive answer that acts to

anticipate an account. In this case the initial response uses the indexical 'I', whereas the account starts by broadening the relevant context by using 'we'; the interviewee is rendering an account based on his membership of a 'we' who are under intense time pressures (utterances [4]-[6]) but who have other desires (utterance [7]). At this point [8], the interviewee switches to 'you' to posit a conditional, just as did the interviewee in Excerpt 5, above¹³. This conditional relates to the circumstances wherein instant access is important in terms of productivity, and this is clearly answering the interview question in terms of 'quantity' (as utterances [10]-[11] show). In utterances [11]-[14] the interviewee reverts to the indexical 'I'. However, after 'I suspect' [14] the speaker changes from the indexical to the researcher 'I', who is 'like quite a few academics' and so on. This sets up an actor to whom 'journals' can refer as 'you' in the imaginary interlocution in utterance [15]. Following this, utterance [17] reprises the conditional in [8], including the use of 'you'.

In Excerpt 6, the interviewee uses a range of subjectivity words, including 'I', 'we' and 'you'. These position him at various points in the interaction as an interviewee and as a researcher, and enable him to engage in complex shifts between these two positions, as his account requires. For example, the interviewer's intervention at [10] might be heard as a challenge to the adequacy of the previous account, since it repeats the interview question. Just as in Excerpt 5, the interviewee immediately reverts to an indexical 'I', emphasising his accountability as an interviewee. However, having previously set up a 'we' (in utterance [4]), the speaker is able to use this membership in [14] as a category entitlement enabling him to account for the scholarly communication tasks that legitimate the researcher role.

Finally, the theme of time appears to be central to Excerpt 6 (as it was in Excerpts 4 and 5), although in ways that are too complex to be address at this point. A clearer picture is apparent in Excerpt 8, below.

13. In terms of frequency in the interviews as a whole, 'if you' was marginally more common than 'if I' (713 instances compared with 680). However, in the sections relating

Formal scholarly communication discourse, such as ‘journals’ and ‘writing’, can be seen in the excerpts discussed above as not only accounting for particular resolutions of conditional scenarios or narrative hierarchies, but as underlying the important subject position of ‘researcher’. We have seen that interviewees, when their accountability as ‘interviewees’ is challenged, adopt tactics such as using the indexical ‘I’ (‘I think that...’) to configure their response as interviewee-talk. Similarly, we can hear scholarly communication talk as addressing the needs of the principal other potential subject position of interviewees, that of ‘researcher’. It not clear whether this is specific to the interviews with researchers from business departments.

S.2. Geography departments, benchmarking interview

The sample of interviews with researchers from geography departments was much smaller than that from either business or manufacturing engineering departments. In general, both the first person singular and the second person were used in the interactions around Question B.13, with the first person plural also making several appearances. Because of the smaller sample, I shall only analyse one excerpt from the geography departments.

Excerpt 7:

- [1] Interviewer: If you could have instant access to any document
[2] Would that make a difference to the quantity or quality of work that
 you were able to do?
[3] Interviewee: I am sure it would
[4] It’s sort of when the inspiration comes
[5] You’re sitting there thinking, ‘right lets look something up’

to Question B.13 the difference was much more marked, with 124 instances of ‘if you’ compared with just 39 of ‘if I’.

- [6] Statistics is quite a useful thing which we tend to use the library for anyway
- [7] If it is not available instantly it very often gets lost in the depth of other activities
- [8] That is a problem
- [9] You know, if you are torn in too many ways at once
- [10] if you cannot get instant access...
- [11] Hopefully the stuff I want is fairly simple and straightforward
- [12] so, census data, european statistics, transport data if we have got it
- [13] I try and get hold of them.
- [14] Interviewer: So you find that particular piece of work or particular idea won't get followed up?
- [15] Interviewee: It does happen
- [16] Then when you come to actually need it you think 'ahh, I haven't got it'.

Following the interview question in utterances [1]-[2], the interviewee in [3] offers a short positive response of the kind noted in previous excerpts, which anticipates an account. In this case the response is in terms of 'I'. The account begins in [4] with a general description of relevant circumstances, and this is made relevant to a subject in [5] by the use of 'you'. The use of the second person acts as an invitation to the interviewer to consider that anyone (including himself) might be 'sitting there'; that this account is not particular to the speaker. This broad view of whom the account is on behalf is made explicit (and also restricted to exclude the interviewer) in utterance [6], where a particular type of material relevant to scholarly communication ('statistics') is described as what 'we' use the library for. This suggests that the account is being offered on behalf of researchers who use statistics, and so acts to work up the speaker's category entitlement as a researcher. As a part of this working up, 'we' at this point excludes the information chain entity 'library'. However, it is not clear yet how the account is relevant to both the question in [1]-[2] and the anticipatory statement in [3]. Therefore, the next two utterances ([7]-[8]) act to configure [5]-[6] as a relevant account. This point (the end of

utterance [8]) is a candidate turn completion because the account can now be heard as both complete and relevant. However, the interviewer does not intervene at this point and the interviewee in [9]-[10] restates the theme of utterance [7], reverting to using 'you' which includes the interviewer and therefore attends to the interviewer's 'missed turn'. In utterance [11], with still no intervention from the interviewer, the interviewee shifts voice again to 'I', and gives an account of the particular kinds of statistics (from [6]) that he wants (and seeks to obtain [13]). These are described in utterance [11] as 'simple and straightforward', which can be seen as a contrast to material that is unavailable instantly (utterance [10]). The use of 'we' in utterance [12] contrasts with that in [6]; in [12] 'we' certainly includes the library, and this perhaps relates to the interactional work being accomplished in the two utterances. In [6] the interviewee is working up a category entitlement for himself as a researcher, whereas in [12] he is using 'we' to denote a referent group that includes himself but excludes the interviewer. This might be understood as attending to the previous non-interventions by the interviewer; the interviewee has offered an account as a researcher concerned with scholarly communication, and this has not been accepted by the interviewer, so he offers an account as a member of a university that includes both researchers and a library. Here, finally, the interviewer intervenes (utterance [14]), asking about a particular inference that might be available from the previous account. In [15], the interviewee confirms that this inference is available, but also that it is not mandated; that is, it is not necessarily so. The syntactic form of 'It does happen' is configured against a potential challenge, not only that 'it does not happen', but also perhaps that 'it should not happen'; there is a possible issue here, then, of blame.

How can we understand what is going on in this interaction in terms of subjectivity and deixis? The first candidate account (utterances [4]-[8]) is phrased using 'you' and 'we'. The first of these acts to generalise the account, whereas the second acts to specify it to a particular group for which the interviewee speaks. However, this account is not heard by the interviewer as adequate, and another is offered in utterances [9]-[13]. Again, this starts using 'you', but this time it shifts to 'I' as a part of a different 'we'. This account is heard by the interviewer as adequate, and its inferences are questioned in utterance [14].

The account [16] supporting the response [15] to this question is also in the form of ‘you’ → ‘I’. We can say, then, that successful accounting practices in this excerpt use ‘you’, ‘we’ and ‘I’.

Finally, the boundary management between scholarly communication and the information chain is worth noting. ‘We’ is used early in the excerpt [6] to associate the speaker with scholarly communication as compared with the information chain (‘library’), and so establish the speaker as a researcher. ‘We’ is used later in the excerpt [12] to include both scholarly and library matters, at which point ‘I’ is used as the voice of the researcher. Why does the speaker not use ‘they’ in [12] to refer to the library? Although explained above in terms of sequential organisation, this shift in the likely referent of ‘we’ can also be heard as attending to the issue of blame made apparent in the syntactic form of [15]. By using ‘we’ to refer to the university as a whole, both researchers and the library, blame cannot easily become attached to any particular entity; that is just how things are.

S.3. Manufacturing engineering departments, benchmarking interview

Again, as with the other departments, the first person plural, ‘we’, was not a common pronoun family in benchmarking interviews with researchers from manufacturing engineering departments, and no specific analysis of its use is offered here. Instead, attention is focused on instances of ‘I’ and ‘you’. There were three types of interaction in this regard, those in which the interviewee predominantly used ‘I’, those in which the interviewee predominantly used ‘you’, and those in which both pronouns were used. Interestingly, there was a high proportion of interviewees from manufacturing engineering departments for whom English was not their first language, and it was these interviewees that tended to use only ‘you’ in their accounts. Most of those using ‘I’ had English as a first language. Analyses in this section are, therefore, grouped according to whether ‘I’, ‘you’ or neither predominated.

First person singular – ‘I’

Excerpt 8:

- [1] Interviewer: If you could have instant access to any document,
[2] Would that make a difference to the quality or quantity of your research?
- [3] Interviewee: It might well do actually
[4] Because it might make it easier for me to keep up to date with what papers are available.
[5] It might be possible for me to spend an hour a month or something like that
[6] Where I just get on the computer and say
[7] ‘ok let’s see what papers have come onto the abstracts’
[8] Look through them see if there’s anything interesting download and that are particularly interesting
[9] And then I’d keep up to date better.
- [10] Interviewer: So that would improve the quality or the quantity?
- [11] Interviewee: Quality
[12] Because it would mean I was more up to date with the material around the subject area.
[13] I wouldn’t necessarily do any more with it
[14] But it would keep me better informed as to what people are doing.
- [15] Interviewer: Can you see any downside to that situation?
- [16] Interviewee: Yeah I might spend time doing that and not actually find anything that’s useful
[17] or be distracted by things that look like they’re interesting
[18] But actually aren’t that relevant to what I’m really doing.
- [19] Interviewer: So it could be a time waster?
- [20] Interviewee: Yeah it could be
[21] That’s very difficult to assess though.
[22] I think in general it’s much more beneficial than the other way.

The frequent uses of both 'I' and 'me' in this excerpt make an analysis in terms of subject/object relevant. In utterance [1] the interviewer defines the interviewee as subject ('you have'), whereas in utterance [2], he defines the interviewee more as object ('your research'). Given that the interviewee is going to use the first person singular, his first task, then, is to decide which of these two options to take up. In utterances [3] (response) and [4] (start of account) we see that, at least at this point, he opts for the latter. This might be understood as an extension of the canonical response to a two-part utterance (Sacks 1987), which is to respond to the latter part first, since in utterance [6] the interviewee for the first time constructs himself as subject ('I just get'). However, this can only be a tentative suggestion at this point. The shift to the subject form occurs in an elaborate hypothetical account, wherein scholarly communication ('papers', 'abstracts') and technology ('computer', 'download') are related to each other. In utterance [10] the interviewer repeats a part of the question from [2], implying that an adequate answer has not yet been forthcoming. The subject ('I') is initially maintained in the following account, which can perhaps be understood as being in the form of a 'show concession' (Antaki and Wetherell 1999). The form is not precisely followed, since the final clause (utterance [14]) does not reprise the first (utterance [12]), and the effect is consequently perhaps not as strong as would be that of a standard 'show concession', since the interviewer in [15] challenges the completeness of the account. This challenge constructs the interviewee unambiguously as subject, and this is the voice of the response in which 'I was more up to date' is contrasted with 'I might be distracted'. The final 'I', in utterance [22], is the only one outside the semantically hypothetical and syntactically conditional scenario in which the subject was first established in [6].

What can we conclude from the above description? The conditional with which the excerpt begins sets the tense for the whole excerpt, so that the participants are discussing a hypothetical scenario. The interviewee is able to cast a whole subjectivity (with subject and object forms) into this scenario, with the particular forms used relating, at least in part, to the interventions by the interviewer. Given this ability, it is clear that the subject positions of both 'interviewee' and 'researcher' are not problematic in this excerpt. The interviewee is able to commit himself to the accounts given as a researcher and, indeed,

to conflate the two positions. That potential negative inferences for the speaker as researcher (for example, from [13]) can be left relatively unattended is evidence that a semantic theme is available to pick up such loose ends. That theme is 'time'.

The theme of 'time' is constructed particularly clearly in this excerpt, and deserves attention. In Excerpt 8, the interviewee supports his positive statement at utterance [3] by setting up what might be called an 'economy of time'; that is, a balance between two kinds of time accounting, one based on being 'up to date' and the other based on 'spend[ing] an hour a month'. The former is concerned with scholarly communication (utterance [7]) and is to be maximised (utterance [9]), whereas the latter is concerned with technology and is to be minimised (utterance [6]). At [10] the interviewer intervenes, asking how is it possible to hear this account as answering the question put in [1]-[2]. Given that [10] is a reprise of [2], then the initial, short response in [11] can be heard as relating to the similarly positive response in [3] and similarly as anticipating an account. In [12] this, in turn, is related to the 'up to date' side of the economy of time. Hence, a positive evaluation can be heard that brings together being up to date with scholarly communication and quality of research output. That this is heard as a positive evaluation is seen in [15], where the interviewer asks for any negatives. The negatives are, as we might expect, concerned with the other side of the economy of time, where papers that at first appear interesting (see utterances [17] and [8]) turn out not to be relevant and thus waste time. Here, then, boundary management between scholarly communication and technology is accomplished through the 'economy of time', which we might imagine as a discursive surrogate for the information chain in this excerpt.

Second person – 'you'

As noted above, most of those who used only, or overwhelmingly, 'you' in their accounts relating to Question B.13 did not have English as a first language. They also tended to be Ph.D. students rather than other types of researcher. The relevance of these categories is noted in a discussion of Excerpt 9.

Excerpt 9:

- [1] Interviewer: If you could have instant access to any document
[2] would that make a difference to the quantity and the quality of your
research?
- [3] Interviewee: Yes sure
- [4] Interviewer: Quantity or quality?
- [5] Interviewee: Quality and the quantity I think
[6] because you would read more
[7] you will see more what you are doing
- [8] Interviewer: You would read more?
- [9] Interviewee: Yes sure if you have access to more
- [10] Interviewer: Yes OK
[11] so how would it make you able to do more research?
- [12] Interviewee: Because as you are saying
[13] we have access to a lot of documents
[14] you can check about your area and about what is more interesting to
you and order maybe as many as you want
[15] This will affect your research because you will see all the papers
that are written under the area and you can take from that
[16] so I am sure it will make the course of your research better and you
will know more about what everyone is doing and you don't have
to be limited with the number.
- [17] Interviewer: Right, that's it for today; thank you very much

The start of the excerpt follows a similar pattern to those above, with the interview question in utterances [1]-[2] followed by a short response [3]. In this case, this response is in two parts ([3] and [5]), prompted by the interviewer, the latter being voiced by 'I'. The following account in utterances [6]-[9] shifts to using 'you'. In utterance [10] the interviewer accepts this account and, in [11], asks about the quantity of research. This has the retrospective effect of casting the account in [6]-[9] as answering the other part of

the interview question [2] and initial response [5], concerning quality. At this point (utterance [12]), the interviewee uses 'you' to refer directly to the interviewer and to the hypothetical scenario in the interview question. In utterance [13] the interviewee uses 'we' to repeat a version of a part of the interview question, before offering a relevant account using 'you'. This account is accepted by the interviewer in [17].

This excerpt shows very clearly a divide between the interviewee's accountability as an interviewee and her accountability as a researcher. The former subject position is indicated by the use of 'I', such as 'I think' (utterance [5]) and 'I am sure' (utterance [16]). The latter appears to be indicated often by the use of 'you'. This allocation of words is only complicated at one point in the excerpt, utterances [12]-[14], but the potential ambiguity in the use of 'you' does not seem to affect the ensuing account or its hearability as an account. Scholarly communication is again an integral part of the discursive construction of the researcher subject position ('you' - see below - in utterances [12]-[16]).

The complexities of previous excerpts seem to be largely absent from Excerpt 9, and this may be for three related reasons. Firstly, as a Ph.D. student, the subject position of 'researcher' may not be sufficiently available to the interviewee to the extent that it was to other, more senior researchers. This could make it difficult to use 'I' for such a position, since the interviewee would need to work up a category entitlement for such an implicit claim. Hence, 'I' was free to be used solely for the interviewee position, and 'you' was used as a way for the speaker to give an account that could have been given by anyone, and so was difficult to challenge on the grounds of (lack of) category entitlement. Secondly, stake management issues may be less pressing for the interviewee as a Ph.D. student than they are for others. Thirdly, as a Ph.D. student, specific actors are available to the interviewee who can be characterised as constraining her research work, for example, 'limited with the number' in utterance [16]. These un-named actors perform the same role as does 'time' in Excerpt 8; they pick up and attend to potentially negative inferences in the accounts. It is no surprise, then, that they are almost certainly elements of the information chain, probably in the library. These features of this interview,

perhaps together with the interviewee's status as a non-native English speaker, could explain the relative simplicity of the accounts. However, other interviewees used 'I' more extensively in their accounts.

Both first and second person – 'I' and 'you'

There were several interviews wherein both 'I' and 'you' were used by manufacturing engineering researchers in answering Question B.13; the following is an example.

Excerpt 10:

- [1] Interviewer: If you could have instant access to any document
[2] would that make a difference to the quantity or quality of your research?
- [3] Interviewee: I don't think any difference to the quantity of research because that is by time rather than anything else.
[4] The quality
[5] because sometimes it does happen now if you are in a hurry and you search through you find ten articles that may be useful and only four are in the library
[6] You make do with that four rather than spend time to wait for the other six and do more thorough comparisons between them
[7] More access obviously knowledge would improve my own research
[8] Especially if I knew that that was very comprehensive and was covering every source that I could possibly get my hands on
[9] and certainly I would be more confident that I wasn't rediscovering all the old stuff
[10] that I was adding to knowledge rather than duplicating it.
- [11] Interviewer: Yes...

The interviewee's first utterance [3], spoken as 'I', contains both a partial response to the question and an account of that response in terms of time (see discussion of Excerpt 8, above). This sets the thematic tone for the second partial response that starts at utterance [4] and uses 'you'. Utterance [5] is an account of [4] (starting with 'because') that starts by making an explicit claim that something 'does happen now', which is a phrasing that might be used to challenge a contradictory claim (that something does not or should not happen now). In this case, there has been no such contradictory claim. However, the phrasing suggests that the account that is to come is configured against a possible challenge of this sort. What this challenge might be is not yet clear. The account itself is of a relatively unsuccessful visit to the library, in which 'you' are in a hurry and, in [6], make do with the articles that are immediately available rather than waiting for a complete picture. Hence, we can see that the challenge against which 'does happen now' is configured is that such things should not happen, that professional researchers should do 'thorough comparisons'. At this point (utterance [7]), the interview shifts voice and, from this point on, offers an account using 'I' and which is phrased in the conditional, locating the account in the hypothetical scenario in the interview question. The account thus shifted, the challengeable inference from [6] is not available.

Here, then, we can see how 'I' and 'you' are used to differentiate between current practice and the hypothetical scenario of the interview question in [1]-[2]. 'You' is used to account for the former; 'I' for the latter. There is, then, some way in which this division parallels that noted above (for example, with regard to Excerpt 9), where 'I' and 'you' we used to differentiate between the possible subject positions of interviewee and researcher. In Excerpt 10 utterances [7]-[10], the speaker can be heard as addressing the interview question (specifically in [7] by the repeat of 'access' from [1]), and this account is given in terms of 'I'. In contrast, in utterances [5]-[6] the speaker uses 'you' to tell how it is as a researcher, which has the effect of enrolling the interviewer into the account and so making the potential negative inferences of this account less open to challenge by the interviewer.

The lexical categories of scholarly communication and time are both used in Excerpt 10 in ways already discussed above. The 'economy of time' (see discussion of Excerpt 8) is apparent in the contrast between being up to date with scholarly work (not 'rediscovering all the old stuff' [9]) and 'spend[ing] time to wait' [6] for articles. Just as in Excerpt 8, the boundary of scholarly work is defined in terms of time, and in this case explicitly associated with the information chain ('library'). A similar issue of potential blame arises from [5] as was apparent toward the end of Excerpt 7. However, the interviewee in Excerpt 10 does not avoid letting this blame lie with the information chain; he is using the boundary as a resource to protect his own discursive identity as a researcher.

S.4. Business departments, evaluation interview

As noted in the introduction, the second set of interviews was with researchers in the same departments as the first, but was concerned substantively to evaluate electronic document access systems. One question in this evaluation interview was comparable to question B.13 discussed above, and that was question E.14 (see Appendix A), in which the interviewer asked the interviewee whether having access to the electronic system being evaluated had, or would have, an effect on the quantity or quality of their research. In the case of the business departments, the electronic document access systems in question were called 'SearchBank' and 'ProQuest Direct'.

With regard to interviewees from business departments, the vast majority of the relevant interactions used 'I', either with 'you' or without. In only two from 29 interviews was 'you' the dominant voice. This repeats and exaggerates the pattern in the benchmarking interviews (see S.1, above). I shall therefore discuss deixis with respect to two excerpts, one (Excerpt 11) in which 'I' is dominant, and one (Excerpt 12) in which both 'I' and 'you' feature substantially.

First person singular – ‘I’

Excerpt 11:

- [1] Interviewer: Do you think having access to SearchBank is going to make any difference to the quantity or quality of your research?
- [2] Interviewee: I don't think to the quality
- [3] because I like to think that the work I'm looking at rests more on the more heavyweight journals and authors than the sort of material in SearchBank
- [4] I think it's been incredibly useful giving me background data
- [5] giving me trade-type things
- [6] and that's valuable and I shall continue to use it for that
- [7] and it would perhaps have more value on the teaching side in terms picking up some of that material
- [8] but in terms of quality of work
- [9] I don't think so
- [10] I mean the quality of work issue for me would be if I had full text on-line access to some of the big journals in the field
- [11] then that would be great
- [12] And the example would be things like the Emerald thing from MCB
- [13] I mean that's still not...
- [14] well some of their journals are pretty good
- [15] That made a difference
- [16] In terms of quantity, again, tools like this would probably help for me
- [17] if I can avoid the temptation to look and look and look
- [18] I think it would probably mean the difference between me doing two and a half articles a year rather than two
- [19] So it's shaving time off
- [20] so an extra article every two years

- [21] I suspect simply the ease of access to things
[22] being able to pick things up in my rhythm rather than rhythm of
the systems
[23] I think this and similar sorts of tools make a difference to that
[24] Interviewer: So it is
[25] in terms of it fitting with the way you work
[26] it is allowing you to control your own schedule
[27] Interviewee: Yes I think so...

In utterance [1], the interviewer asks Question E.14 in a non-hypothetical form; the appropriate response and account is in the future or, perhaps, the present tense, not the conditional. In this way, this reading of E.14 differs from B.13 since it does not offer an 'if' to which the interviewee can appeal, as in Excerpt 10. This would render accounts such as that offered in Excerpt 4 (business department, benchmarking interview) problematic because they rely on a shift between the present and the conditional. As a result perhaps, Excerpt 11 differs from Excerpt 4 in a number of ways.

Firstly, the response in [2] is a negative one; the quality of work is not affected. The account from [3] to [15] is in support of this and constructs the speaker as both an accountable interviewee and a competent researcher who uses 'heavyweight' [3] or 'big' [10] journals rather than just 'trade-type things' [5]. The two subject positions are most clearly related in [3], 'I like to think that the work I'm looking at'. The rhetorical effectiveness of the account is enhanced by its use of the three-part list format in utterances [4] to [9]. The first two parts of the list consist of functions ('giving me background' and 'teaching') and evaluations ('incredibly useful' and 'have more value'). The expected third part of the list in [8]-[9] stands as a contrast, emphasising the account's function in supporting the response given in utterance [2]. Note how the implicit contrast is between SearchBank and scholarly communication ('journals'), so that the researcher subject and scholarly communication stand on the same side of the contrast being made. The remainder of this account [10]-[15] specifies the conditions under which technological systems could make a difference; access to 'big journals in the

field'. This has the effect of configuring the preceding turns as accounting for features of SearchBank rather than features of the speaker's research practices. That is, at [9] it would be possible to infer either that the speaker's research is such that electronic document access systems do not affect its quality or that SearchBank is such that it does not affect the research of any competent researcher. If the speaker is to fulfil his expectations as an interviewee, then only the latter inference is relevant and, to show that this is so, the speaker in [10]-[15] offers an example of an electronic document access system, associated with a publisher, that has made a difference. However, this is problematic for the researcher subject position because, if technology can make a difference, then some aspects of this position are in principle automatable. That is, the boundary between technology and the information chain on the one hand and scholarly research on the other is not successfully drawn in [10]-[15]. This trouble is evident in [13]-[14] and is attended to later in the excerpt.

Secondly, the deferred positive response (utterance [16]) relates to the quantity option from the interview question, and this is explicitly related to technology ('tools'). This response follows immediately from the example that 'made a difference' noted above. The two can be related in a number of ways. For example, (i) the indexical 'this' in utterance [16] can as easily be heard as referring to the 'Emerald thing' from [12] as to SearchBank, and (ii) 'tools' in [16] acts to minimise the automating potential of technology that can make a difference. As in Excerpt 8, a dual economy of time is described, between the potential for waste ('look and look and look') and for efficiency ('shaving time off'). This acts to set the conditions under which the system can make a difference, but does not account for that difference. Hence, at this point the interviewee has to use the semantic theme of time to account for how a system could make a difference to research practice given that such a difference could threaten his subject position as a researcher. To do this, the interviewee makes an implicit contrast between the technology in question and current 'systems' [22], a contrast based on a temporal feature of research practice, rhythm. Thus, the technology in question is heard as empowering rather than automating; allowing the natural rhythm of research to be

pursued rather than threatening to displace the researcher. Again, then, boundary management is achieved through the lexicon of time.

Comparing the deixis in each of these two accounts, we can see that the interviewer subject position acts in both of these accounts as evaluator ('I think', 'I suspect'), configuring them as answers to the interview question. The first account is emphatic in constructing the speaker also as a competent researcher for whom scholarly communication practices are paramount. A conditional is set up in [10] that is similar to that in the benchmarking interviews, and in which the researcher 'I' is constant while his context changes. In the second account, the researcher 'I' is different. Researcher practices are described as being helped by a technological system [16], but the speaker then sets this help up as conditional on his own behaviour [17]. Hence, while the first, negative, response is supported by an account in which the conditional bears on the researcher's context, the second, positive, response is supported by an account in which the conditional bears on the researcher himself. As we have seen above, this troubles the subject position of researcher at this point, because a researcher should conduct himself according to the needs of research rather than according to other 'temptations' [17].

In summary, using only 'I', Excerpt 11 is limited in attending to a troubled researcher subject position. A detailed semantic defence of this position is used using the lexicon of 'time' in order to present the researcher as competent and research practices as not subject to technological determinism. It is possible that using 'you' could have offered a syntactic resource to help in this defence, and I turn now to an excerpt in which both 'I' and 'you' were used.

Both first and second person – ‘I’ and ‘you’

Excerpt 12:

- [1] Interviewer: Ok, do you think having SearchBank is going to make a difference to the quality or quantity of your research?
- [2] Interviewee: That's a difficult question
- [3] I think what it will do,
- [4] I think I will read a wider range of things
- [5] or at least be aware of them
- [6] I mean for some things I will just skim the abstract and that will be sufficient
- [7] I will know that somebody said something at a certain time
- [8] you know
- [9] particularly with FT articles
- [10] I will get the key message and that will be sufficient where I wouldn't perhaps have known it in the past even though I get the FT every day there is a limit of how much you can actually get through.
- [11] Interviewer: Sure
- [12] Interviewee: So yes
- [13] I suspect that will improve the quality because you are just aware of more things that are going on
- [14] As for quantity
- [15] I don't...
- [16] it depends what you mean by quantity
- [17] if you are talking about the actual outputs of research then I don't think it will because there are certain lines of research that I am involved in and the publications that I am expecting to get
- [18] yes I know what they are and I will do them
- [19] you know
- [20] they will get done by some means or other

- [21] Interviewer: Right
- [22] so that level of output is decided by other things?
- [23] Interviewee: Yes
- [24] It's just a question of
- [25] if you like
- [26] how much effort and how well that effort is directed behind the research
- [27] So it's more the quality than quantity I would have thought
- [28] Although some people might do extra things because they can easily get the information
- [29] I do know people who do that
- [30] case study writers etcetera who Hoover up all sorts of electronic stuff and cut and paste it into a good jobbing article and there you are.

As in Excerpt 11, the interview question here (utterance [1]) is in a non-hypothetical form, being in the future tense ('is going to'). The interviewee's initial turn in this case is not a response but an evaluation of the question. An account then follows in [3]-[10] that may relate in some way to this evaluation or to the question or to both (it is not clear yet which). This account is strongly voiced by 'I', with utterances [3], [4], [6], [7] and [10] all starting with 'I'. Initially this 'I' is clearly that of the interviewee offering an account ('I think') but over the course of the account it shifts to refer to the speaker as a researcher in the future. Finally, in [10], this future is compared to the past, at which point the speaker uses 'you' for the first time. This 'you' is the actor in a sub-account that addresses the problematic inference (available at 'in the past') that the speaker is not a competent researcher since he is unaware of 'key messages' relevant to his research. Hence, it is when the subject position of researcher becomes troubled that the speaker shifts to using 'you' in the account. At utterance [11] the interviewer offers support for the interviewee's resolution at the end of [10], and has clearly heard [10] as a part of the interviewee's accounting that requires support in order that this accounting can continue. However, this intervention also seems to emphasise that the interviewee's account needs

to be relevant to the initial question since, at [13]-[14], he returns to the wording of the initial question. Utterance [13], again using 'you', retrospectively configures the account in [3]-[10] as being relevant to one aspect of the interview question, rather than to the interviewee's evaluation of that question in [2]. In utterance [14] the interviewee shifts the focus to the other aspect of the interview question ('quantity'), but the potentially negative response in [15] is aborted in favour of another evaluation of the interview question [16]. The negative response is eventually articulated in [17] as a part of a conditional interpretation of the interview question that posits it as referring to scholarly communication ('publications'). The account is in terms of the character of research that 'I' am involved in; it is this character, rather than any other context, that is the only relevant account for issues of 'quantity'. This account is challengeable because it implies that document access is irrelevant to research (see 'Interests', below), and the potential challenge is addressed in [19]-[20]. The speaker firstly uses 'you know', which enrolls the interviewer into the account, and then implicitly appeals to his own (but, from [19], generally recognised) research skills to explain the lack of other contexts in his account. At [21]-[22] the interviewer acknowledges this account by offering a version of it to the interviewee to confirm, which he does in [23], going on in [27] to configure what has gone before as an answer to the initial interview question.

At the end of the excerpt [28]-[30], the speaker offers an alternative version of the 'quantity' account that supports its main contention that it is the character of the research that determines scholarly communication output. This account (supported by an eyewitness category entitlement in [29]) is in many ways the inverse of that offered in [17]-[20]; the character of the work is different ('case study') and the results are different ('a good jobbing article'). Such work does allow for technological developments to be influential, and to this extent is less influenced by the kind of research implied in [17]. The speaker's ambivalence to this kind of activity is apparent - he does not do this sort of work, it is done by 'some people', who 'hoover' rather than, say, synthesise, and the results are not 'publications' but 'jobbing articles'. The hierarchy being set up at the end of Excerpt 12 can be compared with that in Excerpt 5, which had scholarly communication (writing) at the top and ancillary activities (searching for material) below.

In Excerpt 12, again, scholarly communication is the more legitimate activity, and other work that is associated with technology is less legitimate. We can see both of these hierarchies as working to construct their advocate (the speaker) as someone interested more in research than technology; as a competent researcher. Furthermore, if we compare Excerpt 12 with Excerpt 11, we can see that the 'temptations' away from competent research in Excerpt 11 utterance [17] are directly analogous to the 'extra things' in Excerpt 12 utterance [28]; they are both additional, technology-based activity that a researcher might do if not properly disciplined. In terms of boundary management, technology here is being used as an 'other' against which competent scholarly research can be constructed.

Putting forward these distinctions and hierarchies configures the speaker as appropriately disciplined as a researcher, and so strengthens that subject position. This is then, among other things, available as a category entitlement supporting the subject position and accounting practices of the interviewee. Deictical shifts can also support the interviewee subject position by, for example, diffusing problematic inferences in utterance [10].

S.5. Geography departments, evaluation interview

Unfortunately, the very small number of evaluation interviews with researchers in geography departments meant that any analysis of them would be difficult to justify and is not attempted here.

S.6. Manufacturing engineering departments, evaluation interview

As with the benchmarking interviews, the few interviewees using only 'you' in their interactions around question E.14 did not have English as a first language. Most interviewees used either 'I' or both 'I' and 'you'. An analysis is offered of all three cases.

First person singular – ‘I’

Excerpt 13:

- [1] Interviewer: If you did have access to EiText on a fairly permanent basis
[2] would that have an influence on the quality or quantity of your research?
[3] Interviewee: I’m sure it would yes
[4] I would read much more widely than I have time to at the moment
[5] simply because the convenience of being able to find something in here in the office rather than spending time going to and from the library
[6] Interviewer: You resent the disruption that that causes?
[7] Interviewee: I don’t resent it
[8] I just don’t have time for it

Unlike many cases in the business departments, the manufacturing engineering electronic document access system, EiText, was withdrawn after the evaluation period, and that is why the interview question in [1]-[2] is phrased, like Question B.13 in the benchmarking interviews, as a conditional.

Deictical practices are limited to ‘I’. The response in [3] is voiced as an interviewee (‘I’m sure’), while the remaining uses of ‘I’ refer to the researcher subject position; reading, using the library, being short of time. As in Excerpt 8, the semantic theme of ‘time’ is used to pick up a potentially negative inference from the account in utterance [4], that the speaker’s reading is inadequate. That is, just as in Excerpt 8 (the equivalent excerpt from the benchmarking interviews) the semantic theme is the ‘economy of time’, although in this case the scholarly communication (‘read’) side of the ‘economy of time’ is phrased as a spatial metaphor (‘widely’) rather than a temporal one. The interviewee in this excerpt, like that in Excerpt 10, puts the library (as part of the information chain) on the other side of the economy, that of wasted or, in this case, unavailable time.

The interviewer seems to hear utterance [5] as evaluative, and seeks to confirm this. However, the interviewee in [7]-[8] disputes this hearing, emphasising practical rather than affective consequences of the account in [4]-[5]. This has the effect of configuring the speaker's actions as determined by practical constraints, rather than being the result of 'resentment'. This deterministic account can be heard as another variant of the empirical repertoire used by scientists (Gilbert and Mulkay 1984), wherein states of the world determine and account for human theories or behaviour. The 'I' in utterance [8], therefore, stands in the same relation to the disruptive arrangements of the library as does a scientist to the data, and the interviewer's intervention at [6] can be heard as an unsuccessful attempt to reconfigure this relation in terms of the contingent repertoire of social or psychological factors. It is unsurprising, therefore, to find this attempt resisted, since such a contingent account would be incompatible with the subject position of a competent researcher familiar with scientific accounting practices.

Second person – 'you'

Excerpt 14:

- [1] Interviewer: Do you think having access
[2] assuming it worked and you got your documents back within a
week
[3] would it make a difference on the quality or quantity of your
research?
[4] Interviewee: Of course
[5] it makes...
[6] Interviewer: On how much research or how good research?
[7] Interviewee: It speeds up your research
[8] It depends on what you are doing
[9] but it certainly speeds up the process
[10] which means you can do more of course
[11] And more quality

- [12] It also depends on what kind of work you are doing
- [13] If you are doing theoretical work it helps more
- [14] because if you are doing experimental work for a particular time period it doesn't have any effect on it
- [15] it just affects the end of the work while you are writing up something and at the very start of the work when you are deciding what to do
- [16] But if you are doing theoretical work full-time it is good because most of the time you are reading, writing, looking at ideas and all this stuff
- [17] Interviewer: Okay that's about all we can say about that

As well as being conditional on continued access (see Excerpt 13, above), the interview question in [2] sets up a further condition that the system in question worked adequately, implying that it had not done so during the evaluation period. We can say, therefore, that the interviewee is here answering a very similar question to that in the benchmarking interview. This limitation on the excerpt is reflected in the final acceptance comment of the interviewer in [17].

As with many of the benchmarking interviews, this excerpt begins with a reading of the interview question and a short response by the interviewee. In this case, the positive response is followed by a somewhat enigmatic aborted account in [5]. The interviewer intervenes when this account fails in order to rephrase the two poles of the question; quantity or quality. At this point, in [7]-[9], the interviewee offers what appears to be a three-part 'show concession' (Antaki and Wetherell 1999) to emphasise the potential of the system to 'speed up the process'. The first two parts of this structure are voiced using 'you'. However, this is not a simple show concession, because the 'concession' is hypothetical and is revisited later. Nevertheless, at this point a positive response is clearly indicated. Utterances [10] and [11] configure the previous utterances as answers to the interview question, again using 'you'. At utterance [12] there is a clear reprise of the 'concession' from [8] and this anticipates an assertion in [13] that constitutes the

response of which the interviewees' remaining utterances [14]-[16] are accounts. These accounts are in reverse order, the first [14]-[15] referring to 'experimental work', which is the condition in which the potential of the system to 'speed up the process' [9] is less, and the second bearing directly on the 'theoretical work' [16] that is the explicit subject of the assertion in [13]. These accounts bear on the negative middle part of the apparent 'show concession' in [7]-[9] and serve to introduce scholarly communication ('writing', 'reading') as a key aspect of this conditional. Where scholarly communication is important, then EiText technology will 'speed up the process' and therefore account for utterance [4]; where it is not then the technology 'doesn't have any effect' [14]. Just as in Excerpts 11 and 12, the competent researcher needs to defend her/his subject position from technological determinism. This boundary work is being achieved by putting forward the 'tool' view of technology, that is, implying that the technological effectiveness depends on scholarly research, rather than vice versa.

Because reference to subjectivity is limited to 'you', there is little opportunity for the interviewee to use evidence from his own practices to support his responses or accounts. Of course, this is partially because the system did not seem to work properly, so that the interviewee had few relevant practices to draw on. The resulting responses and accounts are therefore general and hypothetical. Just as with the corresponding excerpt from the benchmarking interviews, Excerpt 9, and probably for similar reasons, this excerpt shows a relative simplicity and inflexibility in terms of subjectivity.

Both first and second person – 'I' and 'you'

As with the benchmarking interviews, most interviewees used both 'I' and 'you' and, as a result, were able to offer responses and accounts that were richer and more sophisticated than those using either word alone.

Excerpt 15:

- [1] Interviewer: If you could have access to either of them
[2] do you think that would make a difference to the quality or quantity
of your research?
- [3] Interviewee: No not really
[4] Unfortunately because of the nature of the ProQuest database
[5] I mean
[6] if you could get Inspec and ABI Inform in that sort of format it
would make a very big difference to me
- [7] Interviewer: Right
[8] And having access to EiText wouldn't make a difference?
- [9] Interviewee: I suppose it would because it is a week opposed to four weeks
[10] the delay
[11] yes it would make a difference
[12] but not as much of a difference as the front end process would make
[13] I mean
[14] currently you have to go out there and get references off CD ROM
[15] sometimes you look at the abstracts and know whether you want it
[16] sometimes you cannot
[17] Has the library got the books?
[18] That whole issue is very time consuming
- [19] Interviewer: Were there any technical issues with using either of them?

Again, because the systems being evaluated were to be withdrawn, Question E.14 is expressed as a conditional in [1]-[2]. In this case, the interviewee had trialled two systems, EiText and ProQuest Direct, and this excerpt is split between them.

As is usual, the interviewee begins her turn with a short, in this case negative, response. The canonical next step, as we have seen above, is an account, and utterance [4] does begin as an account in which the explanatory resource is 'the nature of the ProQuest database', but it is incomplete. The interviewee acknowledges this in utterance [5] ('I

mean') by explicitly re-establishing the interviewee subject position in a gesture that anticipates that the next utterance will start a relevant account or provide the factual or conditional details that will configure what has gone before as a relevant and complete account. How, then, can we hear utterance [6] as supplementing [4] so as to complete an adequate account, as the interviewer clearly does [7]? In terms of relevance, we can tell that [6] is likely to be an answer to [1]-[2] because 'difference to me' is an answer to 'difference to... your research'. In terms of completeness, the situation is more complex.

Utterances [5]-[6] form the first of two instances in this excerpt of 'I mean' → 'you', and this pattern of deictical shift deserves attention. As noted above, 'I mean' was used throughout the interviews as a preface for supplementary accounting, achieving this effect by emphasising the interviewee subject position and the accountability thereof. Both [5] and [13] are examples of 'I mean' in this sense. Using 'I' in this way associates it at these points with the speaker as interviewee rather than with any other subject such as 'researcher'. Hence, another voice is required for the account itself, at least initially. However, is this the only significance of the following 'you' in each case? The conditional in [6] repeats that in the interview question, in which 'you' referred directly to the interviewee. 'You' in [6] could therefore be heard as referring to the interviewer or, at least, as specifically including the interviewer as someone who could 'get Inspec and ABI Inform' (two well-respected databases) 'in that sort of format'. Note that the interviewer had organised the interviewee's access to ProQuest on which this interview is based. The interviewee has thus located accountability for the inadequacy of 'the nature of the ProQuest database' in terms of access arrangements and outside the research practices for which she is accountable. No further account is therefore offered; the account is as complete as it needs to be given the accountability of the speaker's subject position.

In [7]-[8] the interviewer accepts [3]-[6] as an adequate account but challenges the interviewee on the grounds of completeness; she has not addressed the second electronic system. As is common, the response to such a challenge is voiced using 'I', stressing the interviewee subject. The account in [9]-[10] is in terms of time, to which I return below.

However, time is not the only factor in 'difference' as noted in utterances [11]-[12]. In [6], the speaker accounted for 'difference' by reference to 'that sort of format', 'that' being an indexical referring to the previous object 'the ProQuest database'. Similarly, in [12], 'difference' is related to 'the front end process', the definite article implying a link to the previous account of 'difference'. Hence, EiText is being put in the same category as Inspec and ABI Inform, as not making a difference because they do not have the 'format' or 'front end process' of ProQuest. She is now (in [12]) using the format as an explanatory resource and, as in [4]-[6], after naming the resource she uses 'I mean' → 'you' to anticipate an account of this as an explanation.

Instead of offering a conditional as an account, as in [6], the interviewee offers an account of current research practice. As we saw in [6], 'I' is unavailable to account as a researcher immediately after 'I mean', so that [14] uses 'you'. However, this 'you' is not the same as that in [6]. Whereas the conditional of [6] referred to that in [1]-[2] and so to the interviewer, the account of [14] relates to research practice and so to the speaker. She is accountable for her own practice in a way that she is not for 'the nature of the ProQuest database'. Hence, she now has to deal with the potential inference from [11] that her research is not all that it should be. It is in this context that she uses 'you' in [14], which can be heard as enrolling the interviewer and others into this account; getting references and not knowing from abstracts whether articles are useful are things that anyone, including the interviewer, does. Having described this practice as the location of the explanation, the speaker again has to address the issue of relevance. That is, what is it about this practice that makes it an account for 'difference'? It is in the following three-part list (utterances [15]-[17]) and its interpretation in [18] that this issue is addressed. As Atkinson (1984) notes, the three-part list is a useful rhetorical device for suggesting that its semantic contents are merely examples of a larger set. Here, the semantic set is summarised as being concerned with time. As with previous excerpts, and with the account of 'difference' offered in [9]-[10], time and its association with the information chain ('library') is the crucial ingredient in accomplishing boundary management, protecting the subject position of the speaker as a researcher and resolving potentially problematic accounts.

S.7. Deixis and subjectivity: concluding remarks

The interactions studied in this section were highly structured, and consisted mainly of the following:

1. interview question
2. initial response
3. account for response (attending to criteria of relevance and completeness)
4. receipt of account

This structure is similar to that found by Manusov (1996) in investigations of occasions when normal interactional circumstances failed. The response was usually short. The account supported the response by showing how it could be seen to answer the question. In the evaluation interviews, accounts were often split into two parts, addressing criteria of relevance and completeness. The interviewer receipt was acceptance, partial acceptance or rejection. Much of the interaction, and much of the analysis, has focused on the accounts. These accounts had to achieve a number of tasks. Firstly, they had to be successful as accounts in the terms of the interview, and be accepted as so by the interviewer. Secondly, they had to preserve the category entitlement of the researcher on which they were founded. Thirdly, the interviewee accounts can be heard as addressing certain potential problems, most notably that certain kinds of assertion risked making available negative inferences regarding the interviewee as a competent researcher. (Some of these problems are analysed explicitly under 'Interests', below.) These three tasks were accomplished using both syntactic and semantic resources.

The first person singular ('I') was often used as a way for speakers to present themselves as orienting appropriately to their role as interviewees. That is, the role of interviewee involves rendering accountable descriptions and opinions, and 'I' was a way of doing that discursive subjectivity. However, 'I' was also used to refer to the speaker as researcher, in the description of research practices that accounted for their positive and negative responses to the interview questions. A specific use of 'I' was 'I mean', which was an explicit signal that issues of category membership and entitlement were relevant, and

which could therefore preface supplementary parts of split accounts. 'You' was found to be a useful device, enabling speakers to configure accounts as being general, as implicating the interviewer and even as having an ambiguous subject, and therefore being hard to challenge. One specific use of 'you' was also found, 'you know', which was an explicit version of such enrolment. The use of both 'I' and 'you' in the interviews offered more resources to speakers in terms of their accounting practices than did either word alone.

Semantic resources used in accounts included lexicons related to scholarly communication, the information chain and to technology. These were acknowledged in the introduction as being foci of attention. They were often configured against one another. That is, scholarly communication as an activity of researchers was described as being that part of their work that was unaffected by electronic systems, because the lexical register, or repertoire, of scholarly communication ('articles', 'papers written', 'better informed') was used to work up the researcher as a credible voice in the interview. At the same time, another repertoire was used in accounts wherein electronic systems supported scholarly communication, being effective as tools in improving the quality or quantity of researchers' work. In Chapter Eight, I have described these twin repertoires as relating to automation and to empowerment respectively. That is, the fact that the varying technological context did not affect the practices of research was described as partially definitive of those practices; research was what technology could not automate. At the same time, though, most interviewees asserted that the particular systems evaluated would make some difference to them. This apparent contradiction (and resulting trouble for the 'researcher' subject position) was addressed in several ways, most of which invoked 'time' as a basic explanatory resource that was almost always associated with aspects of the information chain, notably the library. This is discussed under 'Interests', below. However, the analyses undertaken above show that the time / information chain lexicon was also split into two repertoires; sometimes according to what I have called above an 'economy of time'. This split was used as a bottom line explanation and resource in accomplishing boundary work between technology and the scholarly communication practices of the researcher subject position. That is, researchers

in the interviews were using the idea of a temporally defined information chain as a way of protecting their identities as practitioners of scholarly work from potentially troublesome inferences regarding the role of technology. As we shall see below, these troublesome potential inferences can be analysed in terms of the interest management practices they provoke.

Interest management in the interviews with researchers

Introduction: focusing the analysis

To reiterate what was noted above, this analysis is concerned with how speakers invoked interests to do things in the interviews, for example as explanatory resources or to discount the views of others as ‘interested’, that is as self-serving. The analysis is not concerned with sociological issues such as whether a particular actor did or did not have an interest in putting forward a certain view. However, the analysis is also not concerned with conversations in which interests were commonly invoked to discount or otherwise alter the standing of versions (Antaki and Horowitz 2000), but with interviews wherein interviewees were asked whether the quantity or quality of their research would be affected by enhanced access to documents (see Appendix A). In this context, interest-relevant discourse might include, for example, instances wherein interviewees responded to these interview questions in certain ways that indicated that their accounts were being configured to prevent them appearing self-serving.

The relevant interview questions (B.13 and E.14 - see Chapter Four and Appendix A) characterised the interviewee as one who either owned or was affiliated with ‘research’ as an object that might be affected by document access arrangements. Interviewees were called on to account for any such potential effects. They thus began their answers with an intersubjective assumption of category entitlement as ‘researcher’, and one of the tasks of the accounts they offered in their answers was to maintain this entitlement while addressing the potential for their research to be affected by circumstances other than their own contributions to it. In particular, the following dilemma was available from the interview questions:

- If researchers claimed that the document access arrangements available to them affected their research (if they answered ‘yes’ to B.13 or E.14), then to the extent that these arrangements were more or less automatable (and this possibility was clear from the context of the interview), an inference was available that some part of what they

did as researchers was technologically determined. This could undermine or erode the role of 'researcher' and so be a threat to their category entitlement as 'researcher'.

- If researchers claimed that their research output was independent of document access arrangements (if they answered 'no' to B.13 or E.14), then they could be heard to imply that access to the research literature, as represented locally by library services, was irrelevant to them. This would clearly be problematic for competent researchers and so, again, might compromise the 'researcher' category membership and entitlement.

It was this potential dilemma that made questions B.13 and E.14 interesting from a discourse analytic perspective. The fact that many interactions following B.13 and E.14 could be understood by reference to this dilemma (as will be shown below) demonstrates its reality for the participants.

One set of syntactic resources available to participants for interest-relevant discourse in the interviews was the pronouns discussed above, and these were also relevant to the sequential organisation of the interview as an interview. However, other resources were also available, including the lexical categories associated with scholarly communication, technology, the information chain and time.

In common with the discussion of interviewees' use of deictical and subjectivity-relevant pronouns above, and as detailed in the introduction, the analysis of interests in the interviews is structured according to a 3*2 matrix whose dimensions are, firstly, the subject area of the interviewee and, secondly, whether the interview was a benchmarking or an evaluation interview.

1.1. Business departments, benchmarking interview

The themes of time, scholarly communication and technology were strongly apparent in the relevant sections of the interviews with researchers in business departments. I shall discuss them with reference to Excerpt 16.

Excerpt 16:

- [1] Interviewer: If you could have instant access to any documents
[2] would that make a difference to quantity or quality of research work
that you could do
- [3] Interviewee: It is frustrating
[4] I think one of the problems that working in a teaching group that
one has in terms of research is that during term time it's actually
very very difficult to find the time to do any research
[5] Therefore when it gets to the summer vacation then I want to do
[6] the summer time is the only time I've got to do my own work
[7] it would be very valuable to be able to say "There's the articles; I
don't now have to spend a week going and getting them out of the
library"
- [8] Interviewer: Because a week is quite a lot in the summer
- [9] Interviewee: Yes
[10] I mean I've done the exercise of bringing myself up to date last
week
[11] actually going in
[12] searching Bids
[13] getting the most recent articles
[14] What I haven't done yet is finding the time to go to the library
[15] which is the next task
[16] partly because I find it such a tedious task that if I could just have
the articles online then I could decide if I wanted to print them off
- [17] Interviewer: So it would give you more time
- [18] Interviewee: I would be able to use the time more fruitfully
[19] and more quickly
- [20] Interviewer: Do you think it would improve the turnaround time for papers
- [21] Interviewee: That's a difficult one
[22] I think it's very hard to say
[23] I think the thinking processes around papers are odd

- [24] I don't think it's a linear process by any means
- [25] There's an awful lot of having to go away and do something completely different and then coming back and the ideas have gelled
- [26] I think what it does do is provide the basis of getting the argument stronger
- [27] so I think you write better papers
- [28] Well I would write better papers
- [29] I think I have
- [30] What it also may do is when a paper is half finished being able to get access to that one or two bits of information which are now available would actually help
- [31] So it may not happen in the initial process but it might as papers are being more closely formulated
- [32] Interviewer: I guess if they need to be revised
- [33] Interviewee: That would really help, yes.

After question B.13 is set out in utterances [1]-[2], the interviewee's first response is a negative evaluation that, as will be shown, relates to the interest dilemma in the interview question. Because this is not an appropriate response to a question, it calls for and so anticipates an account, which follows in [4]. As noted above, the initial intersubjective assumption is that the interviewee has a category entitlement as a researcher. However, in [4] the interviewee immediately expands this entitlement so that she is speaking as a researcher among other things. This allows her to introduce the semantic theme of 'time' as the main way in which this expanded category membership constrains her research. However, her first attempt to use the semantic theme of 'time', in utterance [5], is aborted and repaired in utterance [6]. The difference between the two is that utterance [5] is expressed in terms of a personal desire ('I want') whereas utterance [6] is expressed in terms of the external constraints set up in utterance [4]. That is, a lexicon of personal preference does not work at this point as a way of establishing category entitlement, whereas a semantic theme such as 'time' does. In utterance [7], the interviewee

addresses the interest dilemma from the interview question by asserting explicitly that improved document access arrangements would affect the way she worked - although she does not at this point mention research output. However, having made this assertion, she is at risk from the associated negative inference, that is that there are significant contributions to her research that do not come from her as a competent researcher. Although the interviewer's interjection at [8] is oriented to the theme of 'time', the interviewee spends most of her next turn addressing the potential negative inference from [7]. She begins this account in [10] with 'I mean', which suggests that entitlement issues are at stake, and continues by stating that she has undertaken literature-related work that might be expected of a competent researcher. This account is strongly backed up by a three-part list in [11]-[13], emphasising just how much work she has contributed to her research. Given what has gone before, we can certainly hear this as bolstering the speaker's researcher category entitlement. How, then, does she resolve the interest dilemma between utterances [3]-[7], wherein her contributions to her research are constrained by time and the information chain (library) and would be improved by instant access, and utterances [10]-[13], wherein her contributions to her research are emphasised? In utterances [14]-[16] the interviewee divides her role into that which is task-based and 'tedious' and that which is the core of her research, which may be the subject of 'decide' in [16]. As we shall see, this type of decision is often used by interviewees to manage the boundary between what defines them as researchers and other, less discursively consequential activities that they might undertake. It is in this sense that the interviewee's initial response in [3] can be understood as relating to how matters that should be of little consequence for her as a researcher do, in fact, affect her research.

If we now move on to utterance [20], we can see the interviewer returning to the theme of the original question (and thereby not accepting what has gone before as an adequate answer to it). Does the interest management work undertaken in the first part of the excerpt help the interviewee address the interest dilemma? Again, her initial responses in [21]-[22] anticipate an account, although this time because they signify a unilateral change of topic, from the turnaround time for papers (that is, research output) to the

difficulty in assessing such matters. The work undertaken in the first half of the excerpt, wherein core research work was distinguished from ancillary activities, is used to account for this topic change. That is, research output depends on core activities ('thinking processes') that might be unaffected by document access issues. Once again, though, the interest dilemma resurfaces, because the inference available from this is that library services are irrelevant to researchers. To attempt to address such an inference, the interviewee in [26] switches from the 'quantity' to the 'quality' side of the interview question, claiming that better, rather than more, research papers might result from instant document access. However, in an interesting series of apparent concessions to the dilemmatic (Billig 1996) situation of her accounts to this point, the interviewee in [27]-[29] reduces the force of this claim from 'you write better papers' (that is, anyone would write better papers) to 'I think I have'. The interest dilemma is still in play. As a final attempt to resolve it, the interviewee in [30]-[31] again employs the tactic of dividing up one of the objects that comprise it. This time, instead of dividing the work of a researcher into core and ancillary activities, she divides it into writing and revising a paper, or the 'initial process' and 'being more closely formulated'. At this point the interviewer accepts the interviewee's account as an answer by repeating a form of this final distinction (utterance [32]).

The interest dilemma that was anticipated in the interview question is clearly an issue to which the interviewee in Excerpt 16 is oriented, with much of the interaction following the question being understandable as attempts at its resolution. The semantic theme of 'time' played a role in these accounts, but what about 'technology', 'the information chain' and 'scholarly communication'?

A lexical category of technology is most clearly apparent in utterance [16] ('online', 'print'), which was interpreted above as being a point at which the interviewee completed a distinction between core research work necessary for her category membership as a competent researcher and ancillary tasks. Thus, at this point, technology is being seen as potentially automating the library (information chain) role and empowering researchers to leave behind 'tedious' and time-consuming tasks that are not necessary to their

membership of the category 'researcher'. However, the 'technology as automation' repertoire is highly legitimate, and can potentially apply to many types of work. It is in this context that we can understand the interviewee's description of core research work as 'odd' and not a 'linear process'. These descriptions can be heard as configuring core research work as not machine-like and therefore not susceptible to automation. It may also be possible to interpret this resistance to automation further as orienting to social technologies such as performance indicators and other forms of research output quantification.

So far as scholarly communication is concerned, there are references to both reading and writing papers in Excerpt 16, and in each case they comprise the semantic content of the distinctions noted above, used by the interviewee to address the interest dilemma of the question. The subject of reading (or at least accessing) papers is, perhaps, most in evidence in utterances [7]-[13], and this is where the interviewee is attempting to distinguish between core and ancillary activities undertaken by researchers, the latter being associated with the information chain category. Similarly, the subject of writing papers is clearest in utterances [27]-[31], wherein the interviewee is attempting to distinguish between writing and revising a paper. Hence, we can say that the lexical category of scholarly communication appears to be a flexible resource that can be used by business researchers in the discursive management of their interests as researchers. Were similar patterns apparent in the benchmarking interviews with geography researchers?

1.2. Geography departments, benchmarking interview

As a (small) group, the geography researcher-interviewees were less likely to say that instant access to documents would improve the quality or quantity of their research than were business researcher-interviewees. This meant that they had less to account for in terms of one side of the interest dilemma in the interview question, but their accounts were more oriented to the other side. That is, they oriented to explaining why instant

access to documents would not affect research output while access to the research literature via the library was important. I shall discuss this with reference to Excerpt 17.

Excerpt 17:

- [1] Interviewer: If you could have instant access to any document
[2] would that make a difference to the quantity or quality of your
research
- [3] Interviewee: Well it would in certain cases where we had to check what
somebody had written and if there was no other way of doing it
then that would be of some importance
- [4] I would think though that intervals of two or three days or lag times
of two or three days would be acceptable that way
[5] because that's the way we have worked in the past
[6] a manner of working
- [7] So what we would do is list those articles or references that we
would need some sort of check made
- [8] It's really not worthwhile doing them individually
[9] It's probably better...
- [10] It's probably like asking the refuse collector to come everyday
[11] well it's probably just not cost effective
- [12] So we would tend to accumulate knowing that we would need to do
to carry out the task
- [13] Interviewer: So you have worked like that for a time
[14] and so that the possibility of instant wouldn't actually offer you...
- [15] Interviewee: For myself
[16] but for others it may be different
[17] but I haven't actually found need for instant access
- [18] I think that sometimes publishers expect that you might be able to
do that
- [19] Sometimes it's just annoyed me that we've not had journals in our
library that I could use

- [20] but I know that I could use if I go to Nottingham or something of this kind
- [21] Interviewer: Do you do that
- [22] Interviewee: I have done it in the past
- [23] go to Nottingham if I need to
- [24] So there are occasionally articles
- [25] Then you've got to decide on your travel time
- [26] whether your going to be able to collect the information there
- [27] Interviewer: Do you think your expectations of the library here are rising or falling at the moment...

In common with many interviewees, that in Excerpt 17 responds to the interview question with a summary answer ('it would in certain cases') plus account of how that answer is relevant to the question. In this case the account makes it clear that an affirmative answer to the interview question would only be reasonable in exceptional circumstances. Thus, the major task of the account is to show how the difference between instant document access and current, library-based arrangements is usually irrelevant to research output, and to do so without undermining the interviewee's category entitlement as a researcher. This is addressed firstly in [4]-[6], wherein the interviewee describes delayed access to documents as acceptable because 'that's the way we have worked in the past'. Utterance [5], then, emphasises the interviewee's status as a researcher by including himself in a 'we' that has a history of undertaking research work. That history not only vouches for the status of the interviewee as researcher but also for the status of the research output; it is an appeal to precedent. However, in the context of answering a hypothetical question, such an appeal is challengeable on the grounds that different practices might be appropriate under changed conditions. The interviewee addresses himself to this potential challenge in utterances [7]-[12], wherein a different account is offered of the irrelevance of the difference between instant and delayed access to documents. This account is based on 'cost effectiveness'. The self-repair at utterances [9]-[10] is interesting, in that utterance [9] is expectably the second part of a contrastive pair with utterance [8] ('not worthwhile' / 'probably better'). However, utterance [9] is aborted

because the expectable contrast (that accumulating references and accessing them all at one time is better than accessing them individually as the need arises) cannot be accounted for without asserting that the difference between instant and delayed access to documents is relevant, and this is precisely what the account is meant to be denying. The cost effectiveness lexicon is thus used to address this potential inference.

At utterance [13] the interviewer summarises the account just gone as being about precedent, rather than cost effectiveness. Such summaries are powerful devices available to interviewers to determine what the previous and forthcoming interaction is about. Given that the account immediately prior to the interviewer's interjection relates to the cost effectiveness of instant access, it is likely that the interviewer is using his right to summarise to dismiss this account and return to the earlier 'precedent' account. However, because the interviewee has already acknowledged that this account is challengeable (by offering the 'cost effectiveness' account), he is now faced with addressing this potential challenge again. How does he do this? The cost effectiveness account was offered by 'we', that is, by the interviewee as a member of a category of researchers. The interviewer's interjection at [13]-[14] uses the ambiguous 'you'. This ambiguity is a resource seized upon by the interviewee in [15]. Having established himself, for the moment at least, with the category entitlement of 'researcher', the interviewee in [15] reinterprets his 'precedent' account as necessarily applying only to himself. Much could be said about this radical move, but we are specifically concerned here with how it contributes to addressing the interest dilemma in the interview question. In this it is only partially successful, since in utterance [19] the interviewee admits to having been 'annoyed' by the current arrangements. Although being annoyed is clearly undesirable, it does not necessarily affect research output, so that the interviewee has succeeded in accounting for the irrelevance to his research output of the difference between instant and delayed document access. However, we should note that to do this he has, in utterance [20], re-defined the library service to include libraries other than that at his own university.

By replying negatively to the interview question, the interviewee in Excerpt 17 has brought different accounting requirements into play than arose in Excerpt 16. In particular, the repertoires of technology and scholarly communication are much less clearly in evidence in Excerpt 17. Scholarly communication in the form of access to and reading of articles is invoked as a work practice in utterance [5], but there is no attempt to distinguish different forms of it, as there was in Excerpt 16. Instead, the interest dilemma of the interview question is resolved by asserting the indivisibility of scholarly research practices and their relations with current library services, so that such practices are independent of technological change. Indeed, the lexicon of technology is hardly used in Excerpt 17. The lexicon of the information chain is invoked extensively in terms of libraries and publishers and, unlike the scholarly communication lexicon, it is split (for example, in [18] and [19]) in accounts of both sides of the interest dilemma.

1.3. Manufacturing engineering departments, benchmarking interview

Researchers in manufacturing engineering departments generally gave perhaps less emphatic initial responses to the interview question than did those from business departments, who tended to give positive initial responses, or those from geography departments, who tended to give negative initial responses. However, given the sample size (that is, treating the interview corpus as a sample) this can be only an impressionistic finding. The more cautious responses of manufacturing engineers meant that the canonical research interview form of question-response-account-receipt was less apparent because response and account often merged. The interest dilemma in the question remained, though, and I shall discuss its management with reference to Excerpt 18. This excerpt is perhaps more exemplary than typical, in that the interest dilemma is more graphically articulated than in other interviews.

Excerpt 18:

- [1] Interviewer: If you could have instant access to any document
[2] would that make a difference to the quantity or quality of your
research
- [3] Interviewee: All things being equal yes
[4] Obviously time management comes into that
[5] That's why I am saying all things being equal
[6] At the moment with my research I can use time management
[7] I can find my way through
[8] In some respects that could be quite frightening.
- [9] Interviewer: In what way
- [10] Interviewee: In much the same way that an email seems to require an immediate
response
[11] The same as a fax instigates the requirement for an immediate
response
[12] It's totally subjective
[13] Do you understand what I mean?
- [14] Interviewer: Yes I do know what you mean
- [15] Interviewee: I mean it's a sort of knee jerk
[16] you think 'I had better do something' rather than 'I will read that at
my leisure over a cup of coffee'
- [17] Interviewer: So does that imply that instant access would make a difference to
both the quantity and quality of your research
- [18] Interviewee: It could yes
[19] I don't say it would
[20] I say it could
[21] It depends on how I use it.
- [22] Interviewer: And how can you see it making a difference to the quality
- [23] Interviewee: Because I suppose I would be more up to date
[24] at the cutting edge
[25] Given instant access you can start putting things together pretty

rapidly

[26] Possibly frighteningly rapidly.

[27] Interviewer: And the quantity

[28] Interviewee: Quantity is controlled by other surface factors like hours in a day

[29] Research needs planning

[30] I am not certain it would actually improve the quantity and I think you would actually have a quantity/quality pay off

[31] that's my view.

[32] Interviewer: So overall would you say it is a desirable state of affairs

[33] Interviewee: It is a desirable state of affairs yes.

The interviewee's initial response in utterance [3] is strongly qualified and it is the qualification that prompts an account rather than the response itself. This account is in terms of the 'economy of time', discussed above. In this excerpt, the economy is subject to management by the researcher and this management is one way in which the researcher does being a researcher. This is most evident in utterance [6], which is part of the account for the qualification of the response in [3] ('all things being equal'). Utterance [6] is describing what has to stay 'equal' for instant document access to affect research, and what has to stay 'equal' is that "with my research I can use time management". That is, a relation is being asserted between the researcher's affiliation with his research, his management of time, and the potential effect on research of instant document access. Disrupting this relation threatens his position as a researcher; it is "quite frightening" (utterance [8]). This contrasts with Excerpt 17, wherein current research and scholarly communication practices were described as independent of technological change.

At this point (utterance [9]) the interviewer calls for the interviewee to account for this assertion of a threat to the researcher subject position. The account that follows (utterances [10]-[12]) is an exaggerated version of one side of the interest dilemma set up in the interview question. That is, technological developments such as fax and email seem to turn the deliberate and professional 'time management' [6] undertaken by a

researcher into a simple and potentially automatable stimulus-response activity. This is a somewhat risky admission to make, since it opens the interviewee to the challenge that his membership of the category 'competent researcher' is, on his own account, undermined by the mere existence of technological artefacts such as fax machines. It is perhaps this risk to which he is orienting in his explicit attempt to recruit the interviewer into the account in utterance [13], wherein the usual rules of interview turn-taking are reversed - the interviewee asks a question and the interviewer answers. This is an extended and stronger version of using 'you know' to enrol the recipient into an ongoing account. Having received assurance from the interviewer in utterance [14] that the potential challenge will not be taken up, the interviewee is able to state the position even more starkly in [15] with a direct reference to 'knee jerk' responses, and in [16] with a contrast between characterisations of the researcher in terms of the degree of agency available to him and, by implication, to technology.

So far the whole of the interaction has been concerned with accounting for the qualification of the initial response in utterance [3], rather than with the response itself. Although this discursive work has brought into play a number of resources relating to the interest dilemma in the interview question, it has not been heard by the interviewer as answering that question. Hence, in utterance [17] the question is reiterated. However, the same question gets the same response (a qualified 'yes'), with a curtailed account in [19]-[21] that draws on the discursive work undertaken in [4]-[16]. At this point the interviewer is faced with an interest dilemma of his own, in that his question has not been answered in a way that is satisfactory to him, but repeating the question has not brought a more satisfactory answer. Leaving the question unanswered (from his perspective) undermines his position as interviewer, but merely repeating questions might suggest that his role is automatable; that is, a written questionnaire would have done just as well. Addressing this dilemma, the interviewer in utterances [22] and [27] adopts a strategy already noted above, he divides the problematic object (the question) into two - quality and quantity. This enables him to shift the question from one that asks for a response (and possibly an account) to one using 'how' that takes the response as affirmative and asks only for the account. Asking a question that denies the interviewee an opportunity

to qualify the response makes it difficult for the interviewee to choose to talk about such a qualification.

In this new position, the interviewee in [23]-[25] gives an account in terms of the economy of time flagged at the start of the excerpt in [4]-[7]. Whereas in [4]-[7] the interviewee was accounting for the qualification of the affirmative response, in [23]-[25] he is accounting for the response itself. In both cases, though, the result is 'frightening' (utterances [8] and [26]). That is, the threat to the researcher subject position persists even when considering potential improvements to the quality of research. It is difficult to imagine a more graphic version of the interest dilemma provoked by the interview question.

Having again asserted that instant document access might undermine the role of the researcher, the interviewee is at utterance [26] again (as at utterance [13]) in a discursively problematic position. At [13] he bolstered this position by enrolling the interviewer into the account, but by [26] the interviewer has just bolstered his own position as interviewer by recasting the interview question, so that inverting the rules of interview interaction (as at [13]-[14]) would require considerable work on the part of the interviewee. Instead, the interviewee uses the opportunity offered by the split interview question in [28] to offer for the first time a negative response - research quantity is not affected by instant document access. The interest dilemma now suggests that the interviewee should account for how this response does not undermine the position of the library. That is, if instant access to documents does not lead to more papers being written then would delayed access to documents necessary lead to less papers being written? Of course, the interviewee can rely on the fact that he has already stated (in [23]-[25]) that quality improvements might result from instant access to pick up this potential inference. This complex position is played out in utterances [28]-[31], wherein the economy of time is invoked again to explain a "quantity/quality pay off" [30]. The interviewee's highly equivocal and somewhat confusing stance, although in large measure explainable in terms of the interest dilemma provoked by the interview question, nevertheless prompts

the interviewer in [32] to ask for an overall evaluation of instant access, to which the interviewee responds positively.

This is a complex piece of interaction and accounting, and it certainly cannot be entirely explained with reference to interest-relevant features. Nevertheless, it is clear that the interest dilemma in the interview question does provoke the interviewee into a technological determinist position, which he acknowledges to be problematic. The potential of the automation repertoire to undermine the researcher subject position (defined in terms of scholarly communication) is, then, clear in this excerpt. As has been noted on other occasions (see especially Chapter Eight), the automation repertoire is expectably twinned with another repertoire of technology, that of empowerment. In Excerpt 18 the 'technology-as-empowerment' repertoire is only apparent in utterance [25], but its empowering potential is 'frightening'.

1.4. Business departments, evaluation interview

Simulated and real interests¹⁴

It might be argued that the interest dilemma proposed in the interview question is an analyst's rather than a participant's concern. Against this can be put the demonstrable orientations to the dilemma in the excerpts analysed above. Beyond this, though, the evaluation interviews with business researchers also showed explicit semantic evidence that an interest dilemma was in play. Excerpt 19 gives an example.

14. It is important to note that neither 'simulated' nor 'real' interests refer to a realist interpretation of what is going on. That is, we are not making any claims as to the actual interests of the researcher being interviewed. The simulation / reality distinction is

Excerpt 19:

- [1] Interviewer: Ok
[2] You have access to SearchBank through Derby
[3] do you think it will make a difference to the quantity or quality of
your research
[4] Interviewee: I suppose the politically correct answer is 'yes it would'
[5] but the honest answer is if it would be fully functional
[6] as in if full text is always available and if the university has set it up
so that I can have access from home
[7] then yes it would save me time

The interest dilemma here is that, as utterance [4] implies, the interviewee has a reason outside the scope of the interview to give an affirmative answer, but that this reason is somehow related to what she should be seen to be saying, rather than to reality. What work is done here by claiming a divide between simulation and reality? It constructs a world in which the role of researcher is divided into two and in which the interests of the two are not necessarily congruent. On the one hand, the interests of researchers are, as noted in Chapter Eight (the analysis of interviews with librarians and others), a discursive resource used by professionals to claim roles for particular institutions. That is, librarians need to be able to speak for researchers when claiming a role in the information chain. Similarly, in resource allocation negotiations between the library and academic departments, the interests of researchers are a resource with which expenditure is justified. These are the politics in which there is a "politically correct answer". In other words, a researcher has an interest in asserting that she has an interest in improved document access because it has a positive effect on research, because that second, simulated interest can then be used by others to justify resource allocation favourable to the researcher, her department or her library. However, on the other hand, the researcher has real interests in improving her research or, at least, has an interest in saying so in an interview. These interests are as a result of her working practices (from utterance [6],

entirely within a discursive understanding of the excerpt and relates to how the interaction was accomplished as a comprehensible event.

requiring full text access and working from home), rather than her once-removed role in resource allocation negotiations. They are a part of doing being a researcher and, in utterance [6], the interviewee demonstrates that she has such real interests as well as simulated, “politically correct” ones.

The researcher subject position has, as we have seen above, a somewhat ambivalent relation with technology; several excerpts have been demonstrably configured against a potential for automation (and this could possibly be extended to a resistance to social technologies such as performance indicators and research output measurement). It is in this context that utterance [7] is understandable, in that it stands sequentially as an answer to the interview question but semantically it answers a different question relating, not to research output, but to saving the researcher time. This answer relates to what I have called the researcher’s real, as compared with her simulated interests. The answer relating to the latter has been given in utterance [4]. The contrast between these two answers implies that SearchBank making a difference to research (as in the interview question) is a simulated matter, an issue of saying the “politically correct”. This implication, that aspects of research have to be simulated as well as undertaken, is widely reported (for example, Cooper and Woolgar 1994), and confirmed in utterances [7]-[9] in Excerpt 20.

Excerpt 20:

- [1] Interviewer: Do you think
[2] Assuming you have
[3] now that you have access to ProQuest
[4] that will make a difference to the quality or quantity of your research
[5] Interviewee: Yes of course it will
[6] Anything that helps you access better referencing with more speed
and makes you more inclined to bother with referencing is bound to
improve the quality of your work
[7] And we are all more concerned with quality than quantity

- [8] Except when we are talking to the RAE exercise
[9] in which case we are concerned with both!

The expression of real and simulated interests is perhaps one way of dealing with the kind of interest dilemma that, it has been argued, can be provoked by the interview question. It has been discussed here because two clear examples were apparent among the evaluation interviews with business researchers. However, other approaches were more common.

Analysis of a more typical case

Excerpt 21 shows a more typical (or, better, exemplary) interaction following interview question E.14 than did Excerpts 19 and 20.

Excerpt 21:

- [1] Interviewer: So do you think overall having access to SearchBank is going to
have an effect on how much or the quality of your research
[2] Interviewee: Yes
[3] it's going to save me time
[4] and leave more time available for fieldwork, interviewing and so on
[5] There is so much stuff published that the more efficient and faster
the searches can be done for you
[6] and the more easily you can retrieve the bits you want
[7] you get a bigger overview obviously in the first place of the
literature
[8] and you pick what you want from it more quickly
[9] and then you can go and get on with the fieldwork side of it
[10] Interviewer: Ok
[11] which you see as the real research bit

- [12] Interviewee: Well yes I do
- [13] Research is finding out something about the world
- [14] And this idea of re-jigging what other people have written before
and lashing it together into a different mixture
- [15] I mean a lot of people do this and call it research
- [16] Interviewer: You're not convinced
- [17] Interviewee: I do publish stuff like that
- [18] I do write stuff like that
- [19] and that's fair enough
- [20] I do text books
- [21] I've written two text books and I'm writing another one
- [22] I don't call it research
- [23] but the techniques I use
- [24] the models and all the rest of it are of a high academic level
- [25] and it's a very similar process I do when I am writing a research
study
- [26] But I think research implies you finding out something new

Following the interview question, the interviewee gives an unqualified positive response in utterance [2]. His account begins at utterance [3] by invoking time, which has been a common lexicon in previous accounts (including Excerpt 19, wherein it may have been addressing the potential of social technologies such as performance indicators). However, instead of the 'economy of time' in this excerpt being between spending time on literature-based activities and being up to date with the literature, it is between literature-based activities and "fieldwork, interviewing and so on" (utterance [4]). Here we have another example of an interviewee splitting the researcher role into core research and ancillary activities that can safely be automated. The automation repertoire is used in utterance [5]; "searches can be done for you", which refers to the information chain function. The split is evidence that the interviewee is orienting his talk to the interest dilemma available from the interview question, since it enables him to answer the question affirmatively without risking the safety of his own entitlement as a researcher.

This boundary management is taken as topic in the summarising turn of the interviewer in utterances [10]-[11]. Doing so as an interviewer turn renders an account of the split expectable in the interviewee's next turn, and he orients to this expectation in [13]-[14] by putting forward a relevant characterisation of research that can be and is contrasted with literature-based activities, even literature-based activities that result in articles being published. Such splits are rarely non-hierarchical, though, and the interviewee's contrast between 'research' and 're-jigging' is clearly to the detriment of the latter. This is emphasised by the reference to "what other people have written before", which suggests a lack of originality or even, perhaps, plagiarism. Of course, this hierarchy stems from the interactional work that the split was called on to undertake in the interviewee's first turn, that is, to separate off literature-based activities as those that could be automated without threatening the subject position of the researcher. Hence, at utterance [14] the interviewee has described literature review as 'not really research', where 'research' is a privileged, non-automatable category. Although resolving the interest dilemma provoked by the interview question, this hierarchical splitting has itself led to a new and problematic position since the interviewee could be accused of discursively denying the descriptor 'research', and the prestige and funding that goes with it, from perfectly legitimate academic work. This would clearly be a self-serving assertion, and the remainder of the excerpt can be heard as discursive work that reduces the availability of such an inference.

The relevance of entitlement and subject position issues is first signalled by the 'I mean' in utterance [15], that utterance expressing most clearly the problematic position into which the interviewee has moved. In utterance [16] the interviewer asks for the interviewee to commit himself to the implication from [15] that mere literature review is not real research. The interviewee responds with a list of activities that he undertakes (and therefore, presumably, that he considers to be worthwhile). This list - utterances [17]-[21] - can only make sense in terms of the interaction at hand if it is related to the problematic hierarchy described in [13]-[14]. It is noticeable that, although this list is not in the canonical three-part form, its illocutionary force is strengthened by the repeated use of 'I do X', a syntactic form usual in assertions that are contrary to previous statements or

inferences. Utterance [19] is a positive evaluative comment on the kind of literature-based activities with which the interviewee has just affiliated himself and, again, the form is one typical of evaluations that either follow or anticipate contrary assertions or inferences. Much discursive work, therefore, has gone into adjusting the description of non-literature-based activities from 'rejigging' and 'lashing together' (utterance [14]) other people's work to writing textbooks. The objective has been to maintain the split between literature-based activities and real research, a split that allows the former to be susceptible to automation while defining why the latter is secure from automation. The final move in this project is in a form somewhat similar to a 'show concession' (Antaki and Wetherell 1999), in utterances [21]-[24]. The first part [21] asserts (by personal affiliation) the value of writing textbooks. The second part [22] concedes that the interviewee does not align himself wholly with other people who do this type of work - they "call it research" [15] whereas "I don't call it research" [22]. The final part [23], signalled by 'but', summarises the point of the previous turns, that writing text books is in some ways similar but in other (non-hierarchical) ways is different to research.

The above analysis shows the lengths an interviewee has to go to in order to police the word 'research', to limit the inferences available from its use and to make it thereby available to differentiate work that is susceptible to automation from that which is not. The result is a complex discursive construction of the world in which at least three different types of activity are described:

- literature-based activities that can be made efficient and faster and even 'done for you' [5];
- literature review and writing text books, work that is 'of a high academic level' [24];
- research, which 'implies you finding out something new' [26].

This complex boundary management is directly traceable to and results from an attempt to resolve the interest dilemma in the interview question. This dilemma, in turn, is based on the notion that subject positions and their associated entitlements have to be configured against a number of highly legitimate repertoires, in particular in this case, that of automation and efficiency. Technology, although not explicitly named in the excerpt, is therefore key to understanding the way the interaction developed. Scholarly

communication, as it has been in previous excerpts, seems to be a flexible discursive resource that can be used, for example, to differentiate between different kinds of writing (papers and text books) so as to accord both academic legitimacy.

1.5. Geography departments, evaluation interview

Unfortunately, the very small number of evaluation interviews with researchers in geography departments meant that any analysis of them would be difficult to justify and is not attempted here.

1.6. Manufacturing engineering departments, evaluation interview

In many cases in interviews with researchers in manufacturing engineering departments, the interest dilemma from the interview question E.14 was rendered benign because the electronic system being evaluated (EiText) did not work. However, some researchers were able to retrieve papers using EiText, and Excerpt 22 comes from an interview with such a researcher.

Excerpt 22:

- [1] Interviewer: You will have access to it until I shut it off
- [2] Do you think if you had access to it in the future it would affect the quality or quantity of your research
- [3] Interviewee: Yes
- [4] It will affect the quantity definitely because I tend to order more papers than I would have done previously
- [5] Because it was very variable as well going through the British Library

- [6] sometimes you would get something in two weeks
- [7] sometimes it can take six weeks
- [8] With this system it tends to just take a day or so
- [9] a couple of days or something
- [10] which is much better
- [11] So you would rely on it more I would have thought in that kind of way
- [12] What was the question again
- [13] Interviewer: Would it affect the quality or quantity
- [14] Interviewee: Yeah
- [15] I'd get more done
- [16] Interviewer: You would get more done
- [17] Interviewee: Yes
- [18] Interviewer: Would it be better
- [19] Interviewee: Yes
- [20] I would see it as being better
- [21] Technically speaking the only difference with it for me is that it just saves time
- [22] instead of going to the library I get the paper there and at the end of the day I print it out so it's in my hand
- [23] It's just a very quick way of doing it

The initial response to the interview question is affirmative [3], and the account in [4] specifies that this is because more papers would be ordered using EiText. This is not an obvious link; similar ordering limits to those applicable on the current interlibrary loan would certainly be enforced, so why should the researcher order more papers using EiText? The interviewee acknowledges that a further account is required by starting [5] with another 'because'. Utterance [5] is key to this interaction because it introduces or includes all the themes that later utterances will address, account for or expand on. Firstly, the current library-based system of document access (that is, the information chain) is defined as problematic ("very variable"). Secondly, delivery time ("it") is

implied as a key issue. Thirdly, these matters are used interactively as an account for why the researcher would order more papers via another system and therefore would do more research. By defining the current document access arrangements as problematic in a way that is resolved by EiText (in utterances [6]-[9]), the interviewee is able to suggest the appropriate domain for automation. This domain is the library (or the British Library), not the work of the researcher, so that accountability for the interest dilemma in the interview question is transferred away from the researcher and to the library or information chain generally. The similarity in operational arrangements between EiText and conventional paper interlibrary loan may have been a factor in facilitating this discursive transfer. It must be noted, though, that this appears to be a rhetorically weak transfer - the interviewee as a researcher is still admitting that the quantity of his work is dependent on technological matters associated with the information chain rather than his own efforts. The weakness of the resolution is not helped by utterance [12].

At [11]-[12] the interviewee appears to have forgotten the point he was supporting by his comparison between EiText and the British Library. After a series of turns in which the initial response and, by implication its accounts, is confirmed, the interviewer in [18] asks whether “it would be better”. Given the interview question, this might be interpreted as ‘would the research be better quality?’, but the interviewee’s response does not support that interpretation. Instead, utterance [20] suggests that his interpretation is nearer ‘would the electronic system be better than the current one?’. Given his previous assertions, it is unsurprising to find an affirmative answer at [20]. However, what is the significance of “technically speaking” in utterance [21]? In what way might there be other, non-technical differences between the current and the electronic systems? How would these be ‘non-technical’ differences? Again, in utterance [23], what is the significance of “just”? What are utterances [21]-[23] accounting for? “Technically” suggests that the interviewee is making a distinction between what is inherent in the document access systems and what he, as a competent researcher, is able to do as a result of these technical differences. This reading is confirmed when we consider “just” in utterance [23], which again implies a stripping away of consequences and a focus on differences inherent to the systems. Why would the interviewee want to make this

distinction at this point in the interaction? The answer may refer us back to the interest dilemma in the interview question and its rather unsatisfactory resolution in utterances [4]-[12]. By noting that the only difference between the document access systems is merely 'technical', and that differences in research output consequent on those technical differences are the result of his own efforts as a competent researcher, the interviewee maintains the subject position and entitlements of such a researcher. This is a much more satisfactory resolution of the interest dilemma than was achieved earlier in the interaction. Once again, we can see how splitting a problematic object, in this case the difference between two document access systems, an interviewee can police the repertoire of automation, keeping it safely away from his role as a researcher. The information chain is a valuable lexical resource in this kind of boundary work.

1.7. Interests: concluding remarks

It was suggested that the interview questions B.13 and E.14 offered an interest dilemma to interviewees. Analysis of a number of excerpts has shown that the speakers therein oriented to such a dilemma, and that this dilemma was therefore a reasonable way to structure an explanation of those interactions. The question of the category entitlement of the interviewee as a researcher was central to this interest dilemma, since such an entitlement was essential to the credibility of their accounts. Just as in the analyses that focused on deixis and subjectivity in the interviews, both syntactic and semantic resources were available to speakers in addressing the interest dilemma. In addition, a rhetorical device of 'splitting' was frequently used.

Syntactic resources used by the speakers included the types of personal pronoun use discussed in detail under 'Deixis and subjectivity'. Again, both 'you know' and 'I mean' were used as stronger and more explicit versions of enrolment and entitlement work respectively. That is, 'you know' was used as an attempt to enrol the recipient into the account being given, and 'I mean' was used to signal that issues of category entitlement (either as 'researcher' or as 'interviewee') were at stake. In addition, there were

examples of three part lists, of 'we' being used to do entitlement work, and of the interviewer using summaries to direct the course of the interaction.

Both the interviewee and the interviewer, when confronted with interest dilemmas, or dilemmas that threatened their membership of relevant categories, split particular discursive objects in order to preserve that membership. In particular, the interviewees, when faced with the potential problems of the 'automation repertoire' (see below), often split the object 'research' into what might be described as 'core research' and 'ancillary activities'. Core research was, by definition, that which was peculiar to researchers and which could not be automated. Ancillary activities defined the information chain, which could be automated. Much work was apparent in policing this distinction and in dealing with problematic inferences that might be available from it in particular cases. Other splits included those between simulated and real interests, between initial drafting and final revision of papers and between the technical properties of a system and their research consequences. I am not arguing here that such distinctions were in any way illegitimate, merely that the places at which they were made in an interaction were significant and analysable.

The four sets of lexical resources that were identified, or were anticipated, in the analyses under 'Deixis and subjectivity' were also apparent in the excerpts analysed in this section. These were time, scholarly communication, the information chain and technology. Their discursive roles were similar to those outlined above. The lexicon, or economy, of time was again used as a bottom-line realist description of work practices and constraints, often associated with the information chain. Scholarly communication, in terms of research input / output practices and the researcher subject position, was the usual semantic content of the 'splitting' moves described above. The automation repertoire was, again, not only present explicitly, but could be described almost as a structural element in the interactions. That is, the interview interactions, in dealing with the interest dilemma, were structurally oriented to the highly legitimate repertoire of automation and its potential threat to the subject position of researcher. Interviewees who described research as 'non-linear' could be understood as proposing qualities that were

not susceptible to automation. In extreme cases, a naïve technological determinism was apparent both in what the interviewees seemed to be saying and in what they seemed to be configuring their utterances against.

Interviews with researchers: summary and conclusions

The interactions analysed consisted of excerpts from interviews between an interviewer (the author) and interviewees who were (also) academic researchers. The excerpts analysed do not in any way form a statistically valid sample of such interactions; it is hard to imagine what such a sample could be. Nevertheless, the analysis has included excerpts from two sets of interviews and interviewees across several subject areas, levels of experience, and so on. Although the excerpts were selected to illustrate clearly the discursive practices analysable under the headings of 'Deixis and subjectivity' and 'Interests', these practices were apparent in other excerpts not selected and there is nothing inherent in them that suggests that they would be limited to the interviews undertaken.

Two analytic foci were used to structure the analyses:

- deixis and subjectivity; and
- interest management.

Other analytic foci, such as rhetorical splitting in accounts and the role of interviewer summaries, emerged as important at various points in the analyses. Three topical foci were also acknowledged, and these were:

- scholarly communication;
- the information chain; and
- technology.

A fourth topical focus, that of time, emerged from the analysis. Evidence was found of discursive boundary management between these topics.

The analytic focus on deixis and subjectivity was further specified to relate to uses of 'I' and 'you' by the interviewee. Analyses of uses of 'I' suggested that it signalled the relevance of matters concerning the subject positions 'interviewee' or 'researcher'. An expression such as 'I mean' was a stronger signal. These signals occurred when the interactive business at hand troubled one or other subject position. That is, if an

inference was available from an immediately preceding turn that undermined the category membership of the speaker as, for example, a competent interviewee, then the use of 'I' could be expected as a part of a reassertion of that membership. This empirical finding could, then, be used to locate and analyse such potential subjectivity trouble. The interviewees' use of 'you' was related to this in some instances. For example, 'you know' appeared to be used as a way of enrolling the interviewer into an account that was, for whatever reason, in need of such inoculation from challenge. It could be thought of as an abbreviation of a sequence such as:

Interviewee: Do you know what I mean?

Interviewer: Yes

There was a preference structure (Silverman 1998) associated with the question; 'yes' was expected; 'no' might have required an account as to what was not understood. However, the consequence for the interviewer of answering 'yes' was that he had thereby in some ways associated himself with the preceding account, making it more difficult for him subsequently to challenge that account. 'You' was also used as a form of transitivity (Fowler 1991), that is, as a particular way of putting forward propositions. What using 'you' achieved was a degree of ambiguity of reference, or slippage, that was available to the speaker in their subsequent use of those propositions. This might be thought of as a mild but common version of 'plausible deniability' (Bogen and Lynch 1989), in which accounts and their supporting evidence are mutually developed. Although present in the interviews with academic researchers, this use of 'you' appeared to be less common there than in interviews with information professionals (see Chapter Eight).

The analytic focus on interest management was based on a premise that the interview question could be understood as making available an interest dilemma for the interviewees. That dilemma was that problematic inferences were available from both affirmative and negative answers to the interview question. Analysis of a number of excerpts strongly suggested that this dilemma was oriented to by interviewees.

Furthermore, this analysis of the interview interaction uncovered a number of ways in

which interviewees dealt with the dilemma using both syntactic and semantic resources. Syntactic resources included patterns of deixis and transitivity such as those discussed above. Semantic resources included the lexicons of technology, the information chain, scholarly communication and time, and are discussed below. One device used by both interviewees and the interviewer was that of 'splitting'. That is to say, when an account encounters a dilemma, one way of resolving the dilemma is to split one of the objects that make up the dilemma. For example, several interviewees split 'research' (a word that appeared in the interview questions) into two components, attributing differing properties to each and thereby resolving a dilemma associated with research. Policing such distinctions could itself involve considerable discursive work, however, since the attribution of properties could carry problematic inferences. Such policing frequently evidenced boundary work between the three topical lexical categories.

The topical focus on scholarly communication found that this lexicon (for example, reading and writing papers) was used as a flexible resource by interviewees. It was often used to bolster the interviewees' category membership as 'researchers'. However, it was also the usual semantic content of rhetorical splitting moves. This was effective when contrasting scholarly research work with other activities that might be automated, and these were often defined as the information chain. In Chapter Eight, I will describe how a lexicon of technology can be used in two repertoires, those of automation and empowerment. It could be argued that the automation repertoire achieved the status of structure in the interviews with academic researchers, because much of the interview interaction could best be understood as configuring the researcher subject position as immune to its effects. That is, research was defined at least partially as those non-automatible activities undertaken by the interviewees as researchers. Given that the question of machine-based scientific discovery is on the research agenda (Slezak 1989; Sleeman, Corruble and Valdés-Pérez 2000), this is a consequential finding. Finally, the lexicon of time was used as a bottom line explanation, often in terms of an 'economy of time' balancing up-to-date information or fieldwork with time spent on literature-oriented activities. In terms of its efficacy as a boundary management device, this should probably be seen as a highly legitimate lexical resource for making accounts realistic, that

is, as conforming to realist narrative conventions and constraints. It also offered an object ('time') whose management could be evidence of competence.

Chapter Seven: Co-word analysis of interviews with information professionals

Introduction

The objective of this chapter is to investigate how information professionals talked about that information chain, scholarly communication and technology. The principles and procedures of the co-word methodology have been described in Chapter Three and the relevant data have been described in Chapter Four. This chapter is concerned with presenting the analysis of interviews with librarians, publishers and so on. Note that Chapter Three also includes a key to the diagrams presented in this chapter.

The interviews with people working in the information chain can be divided according to whether the interviewee worked in an academic library, the BLDSC or a commercial company, for example, a publisher. It was thought that the discourse of people working in commercial companies would be influenced by the imperatives of that environment, which, it can be argued, is different to the environment of academic libraries. BLDSC is something of a middle case, being a part of a library but operating as a commercial organisation. While being an unjustifiable resort to an externally defined context according to the actor-network perspective, it was considered that this breakdown offered a reasonable cut into the data, and that the degree of reasonableness could, in any case, be one of the findings of the research. Therefore, four analyses are included: the whole information professional interview corpus (as a benchmarking exercise), and interviews with librarians, BLDSC managers and people working in commercial companies.

Whole interview corpus (information professionals)

This section is concerned with the whole information professional interview corpus, which amounted to 33 interviews. In later sections this corpus is broken down according to the organisation in which the interviewee worked. Methodologically, this section provides the model for the remaining analyses, and substantively it provides a baseline against which the results of the various other analyses can be compared. The results are given in the following order:

- Graphical estimation of the core words used most frequently;
- Global network showing the overall distribution of the words in the interviews according to the S (association) and the I (inclusion) indexes;
- Leximappes for the whole corpus;
- Synthesis of leximappes to show 'information chain', 'scholarly communication' and 'technology' networks in relation to each other.

Graphical estimation of the core

As noted in Chapter Three, a core of words for each corpus was estimated from the Bradford-like distribution of the prompt words for each corpus. The non-linear section of the graph for the whole information professional interview corpus included all words ranking above Log 3.6, which gave a core of words as follows:

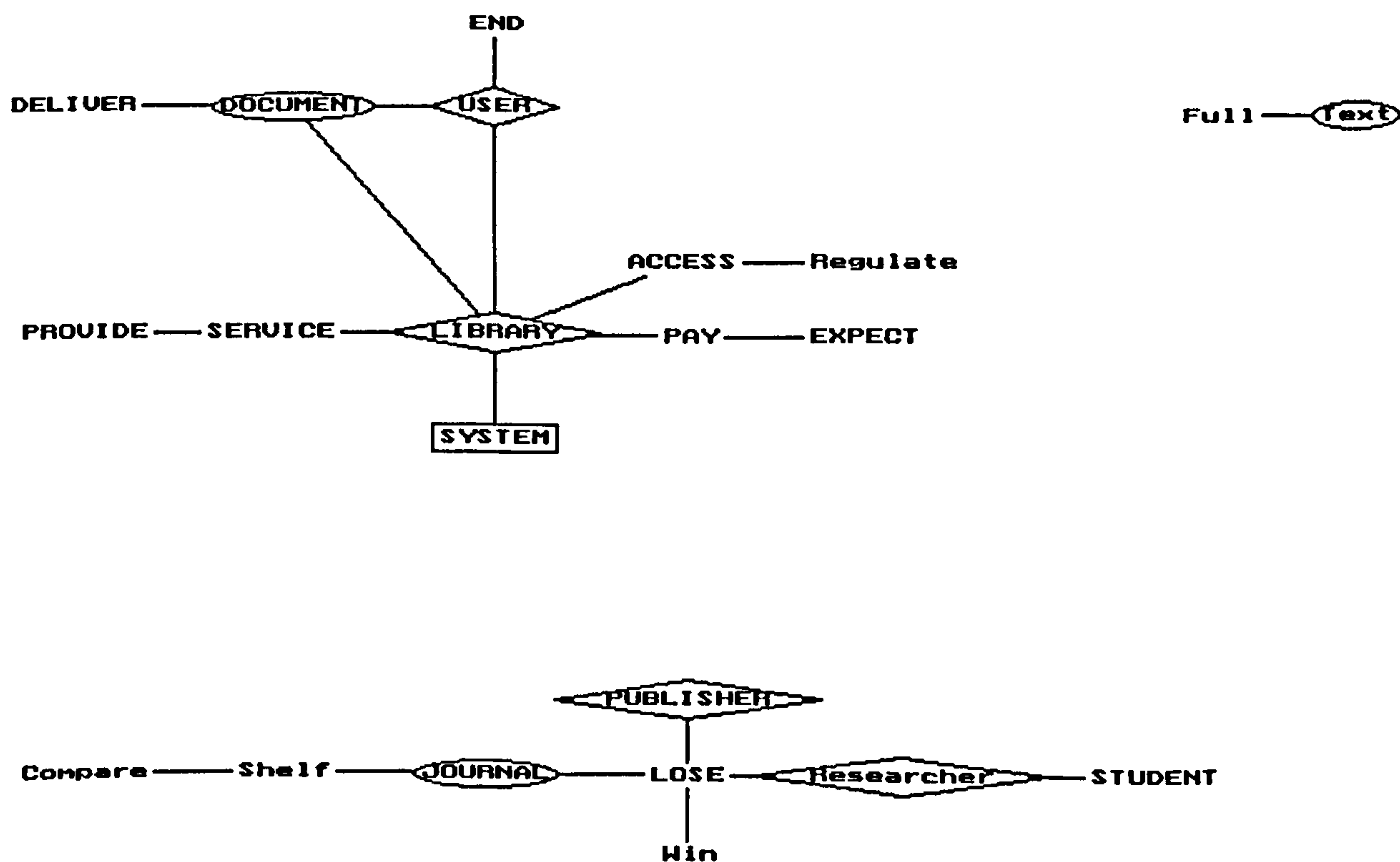
LIBRARY, SYSTEM, ACCESS, DOCUMENT, USER, PAY, PEOPLE, USE, SERVICE, DATABASE, SUPPLIER, UNIVERSITIES, NEED, DELIVER, JOURNAL, DEPARTMENT, TIME, CHARGE, END, WORK, INFORMATION, EXPECT, PROVIDE, TERM, BUDGET, CONTROL, PUBLISHER, LOSE, STUDENT, ORDER, LOOK, ELECTRONIC, SUBSCRIPTION, REQUEST, COST, DEPEND.

In the network diagrams and leximappes that follow, these words are capitalised.

Global network diagrams

The global association network diagram for the whole information professional interview corpus, including interviews with people working in academic libraries, BLDSC and commercial companies, is shown at two threshold values of the association index in Figures 100 and 101.

Figure 100: The global association network diagram from the whole information professional corpus (1)
(threshold $S = 0.13$)



At this high threshold value of the association index we can make out clusters relating clearly to questions from the interview schedule. The secondary network toward the bottom of the diagram, around 'Lose', is a network representation of Question 5, which reads "Compared to journals-on-the-shelf, who wins and who loses? For example; publishers, suppliers, libraries, researchers, students, university administration, no-one." Two of the dyadic clusters attached to 'Library' are also representations of interview

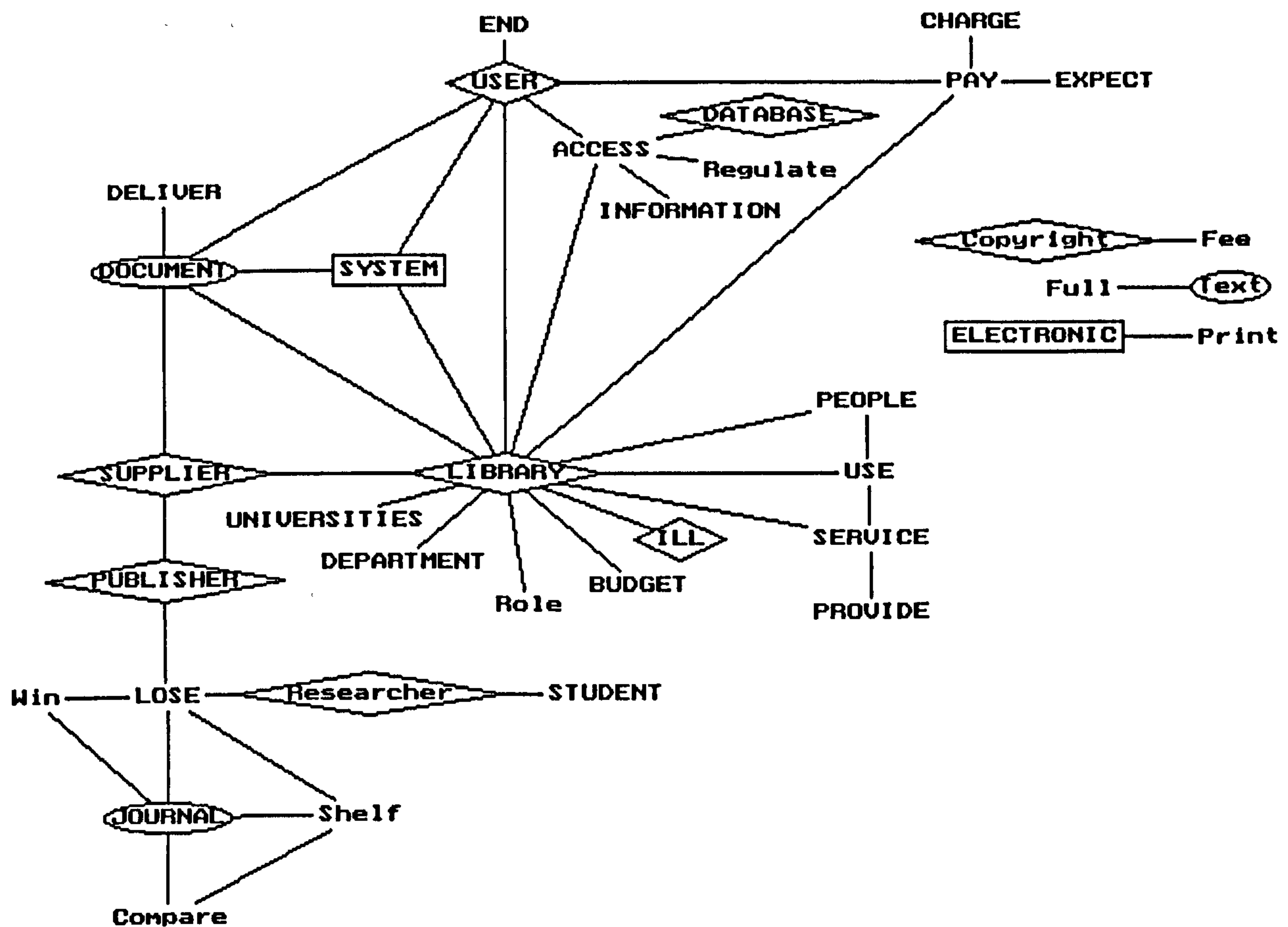
questions, {Access-Regulate} and {Expect-Pay}. However, even allowing for this, the central position of 'Library' is clear. It seems to be associated with a number of clusters, including:

- {Regulate-Access} and {Expect-Pay} from the interview schedule;
- {Provide-Service};
- {End-User-Document-Deliver}.

The last of these is most clearly related to the information chain (although 'Deliver' is not an information chain word, 'Delivery' is). The dyad {Full-Text} probably refers to an implicit comparison between full-text and bibliographic resources, for example, databases. Apart from {Library-User}, the other information chain words are in the network representation of Question 5. The ambiguous 'System' is the only technology word. If we increase the detail by decreasing the threshold value, we get Figure 101. I have tried in Figure 101 to maintain some of the layout of Figure 100 so that it is possible to see how Figure 101 has grown from Figure 100.

Figure 101: The global association network diagram from the whole information professional corpus (2)

(threshold $S = 0.1$)



Note: ILL stands for 'interlibrary loan'.

The first thing to note is that at this threshold level of the association index, $S=0.1$, the diagram has become somewhat more complex. The central position of 'Library' is even more emphasised than in Figure 100, with the addition of several new words linked to it. In terms of the actor-network, the punctuation focused on 'Library' as a centre of translation is more apparent in Figure 101 than in Figure 100. The two networks from Figure 100 have been linked via {Publisher-Supplier-Document}. The categories of the information chain and scholarly communication are linked via 'Document', whereas {User-System-Library} is the point of contact between the categories of technology and the information chain. The influence of the interview schedule on the network is as apparent in Figure 101 as it was in Figure 100, with specific clusters growing around question-oriented dyads such as {Regulate-Access}.

To investigate the actor-network of translations further, a global network diagram was generated from a matrix of inclusion indices, and is shown in Figure 102.

Figure 102: The global inclusion network diagram from the whole information professional corpus
(threshold I = 0.6)

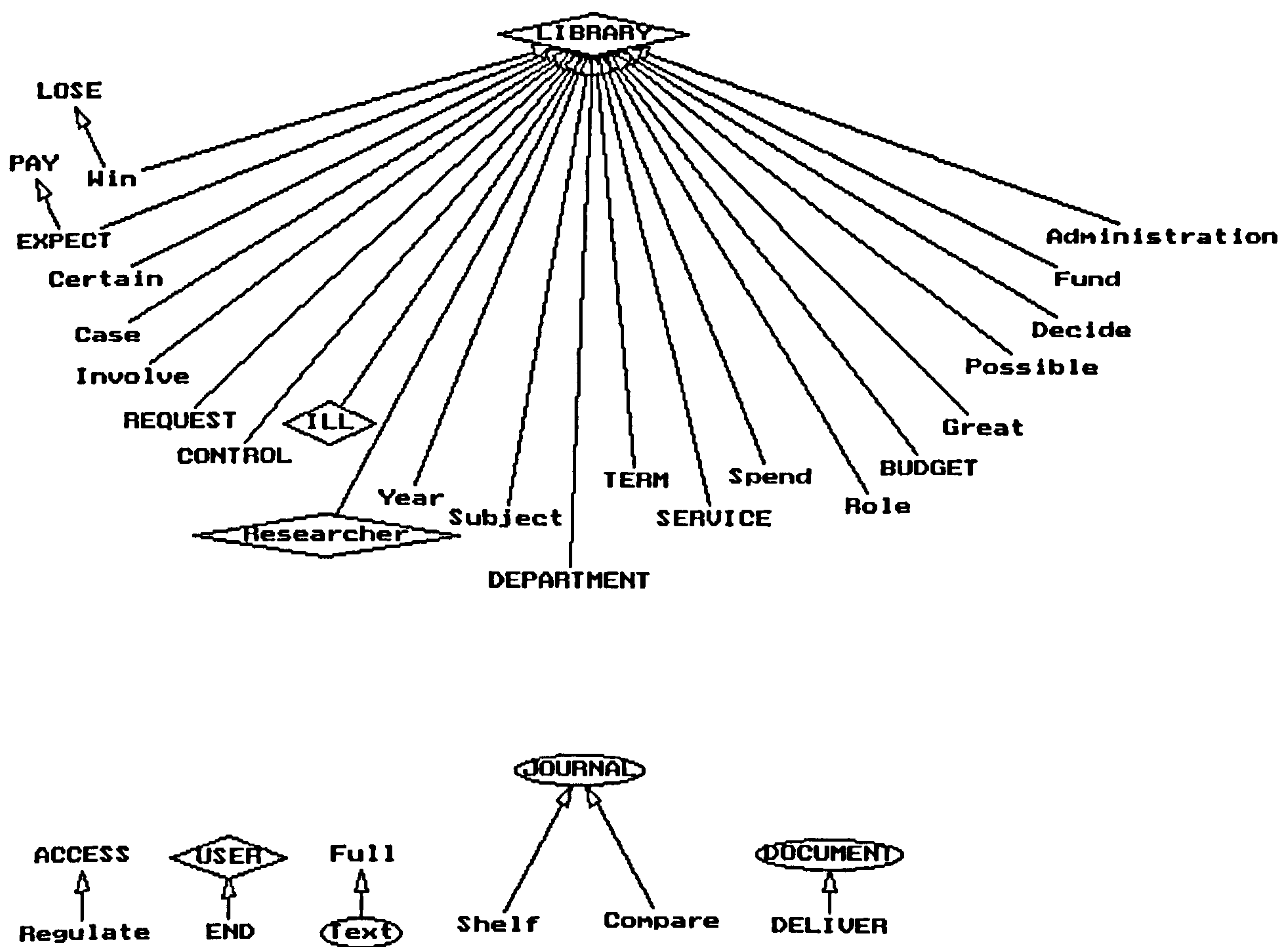


Figure 102 dramatically confirms the central position of 'Library' in the actor-network in the corpus, with a large number of words tending only to appear in combination with it.

These vary widely, and include:

- 'Budget', 'Spend' and 'Fund';
- 'Department', 'Administration' and 'Control';
- 'Term' and 'Year'

Such a breakdown clearly imposes categories on the data, but the point being made is to emphasise the variety of less frequently used words that 'Library' tends to include.

Thinking in terms of the actor-network, 'Library' is clearly a centre of translation within the discourse of interviewees from the information chain, its heterogeneous actor-network linking elements conventionally categorised as financial, organisational and temporal.

In terms of the information chain category words, both 'Researcher' and 'ILL' are a part of the 'Library' actor-network, they being the only examples at this resolution.

It was difficult to infer much more from the global network diagrams for the whole corpus. Certainly, the second level of analysis, how clusters linked to each other, was difficult from only the global network diagrams. However, a finer-grained analysis was possible using the leximappe procedure, and the results of this are discussed below.

Leximappes

A series of leximappes were produced for each corpus, as described in Chapter Three, and these offered a way of focusing attention on how semantic clusters were related to each other. The series for the whole information professional corpus is shown here. The figures at the head of each diagram give technical information relating to the production of the leximappe; for details the reader is referred to Chapter Three.

Figure 103: Whole information professional corpus - Leximappe A

Seed pair {Full-Text} S = 0.72

Minimum S for internal links = 0.087 Minimum S for external links = 0.10

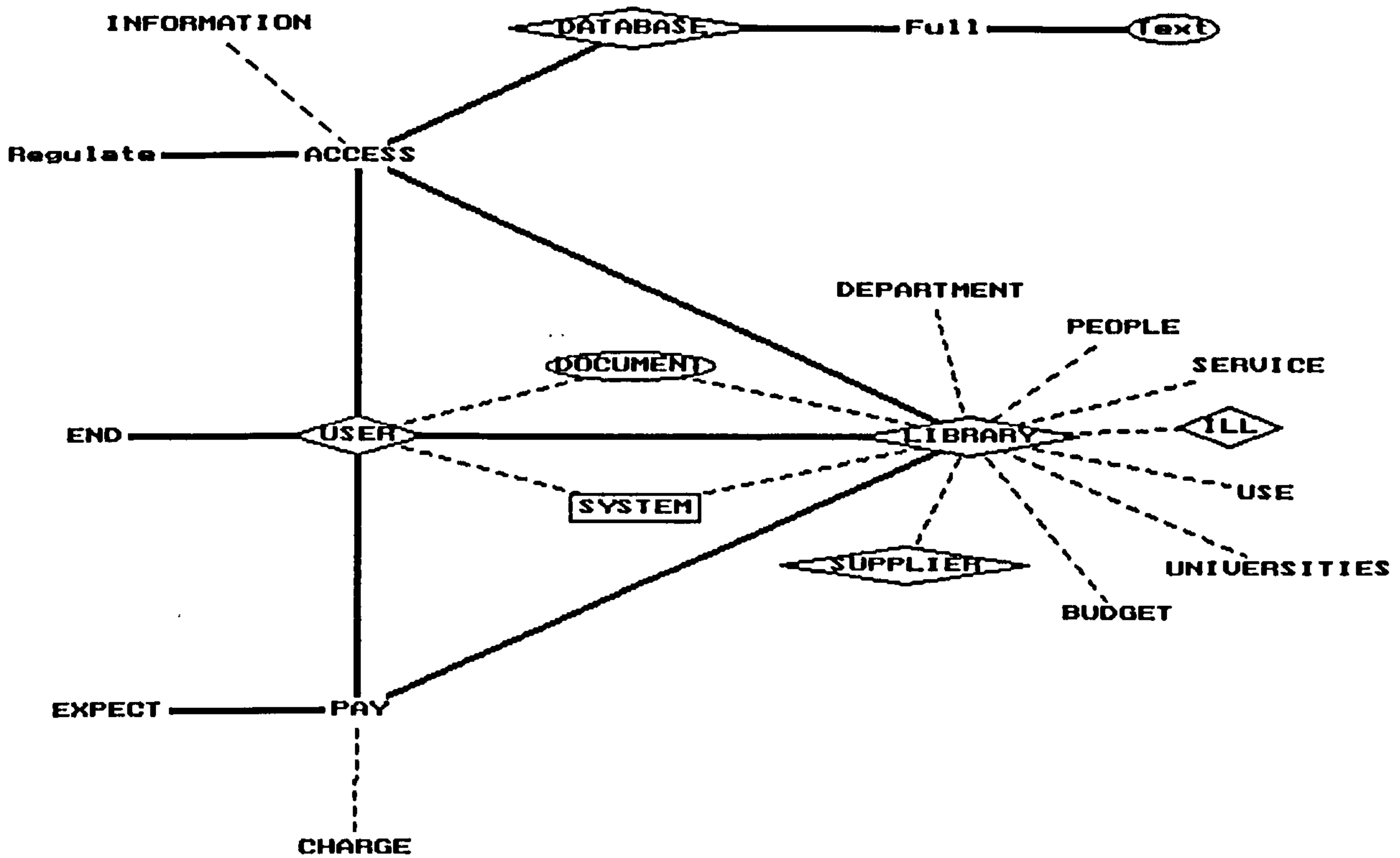


Figure 104: Whole information professional corpus - Leximappe B

Seed pair {Win-Lose} S = 0.32

Minimum S for internal links = 0.11 Minimum S for external links = 0.080

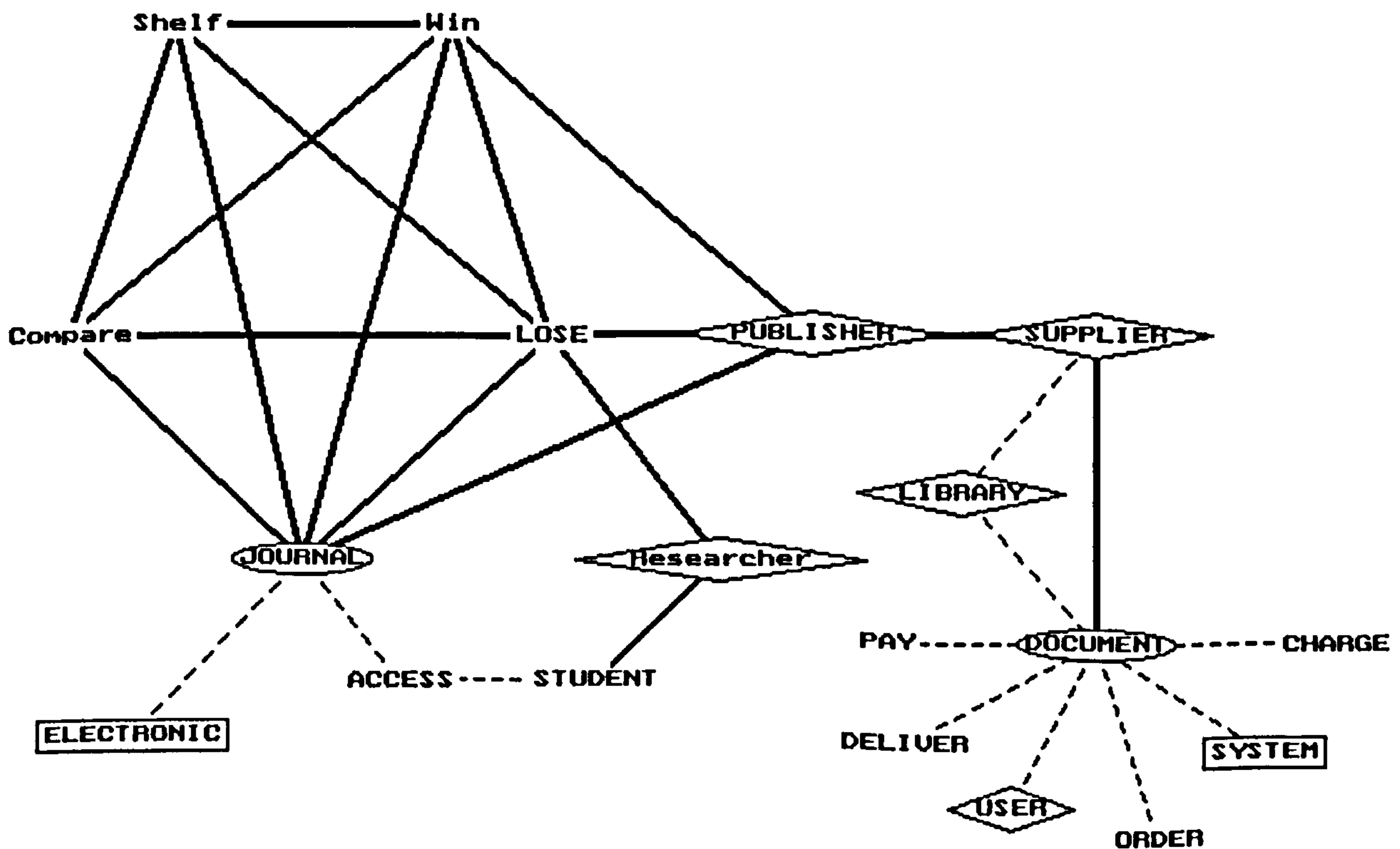


Figure 105: Whole information professional corpus - Leximappe C
 Seed pair {Provide-Service} S = 0.16
 Minimum S for internal links = 0.080 Minimum S for external links = 0.080

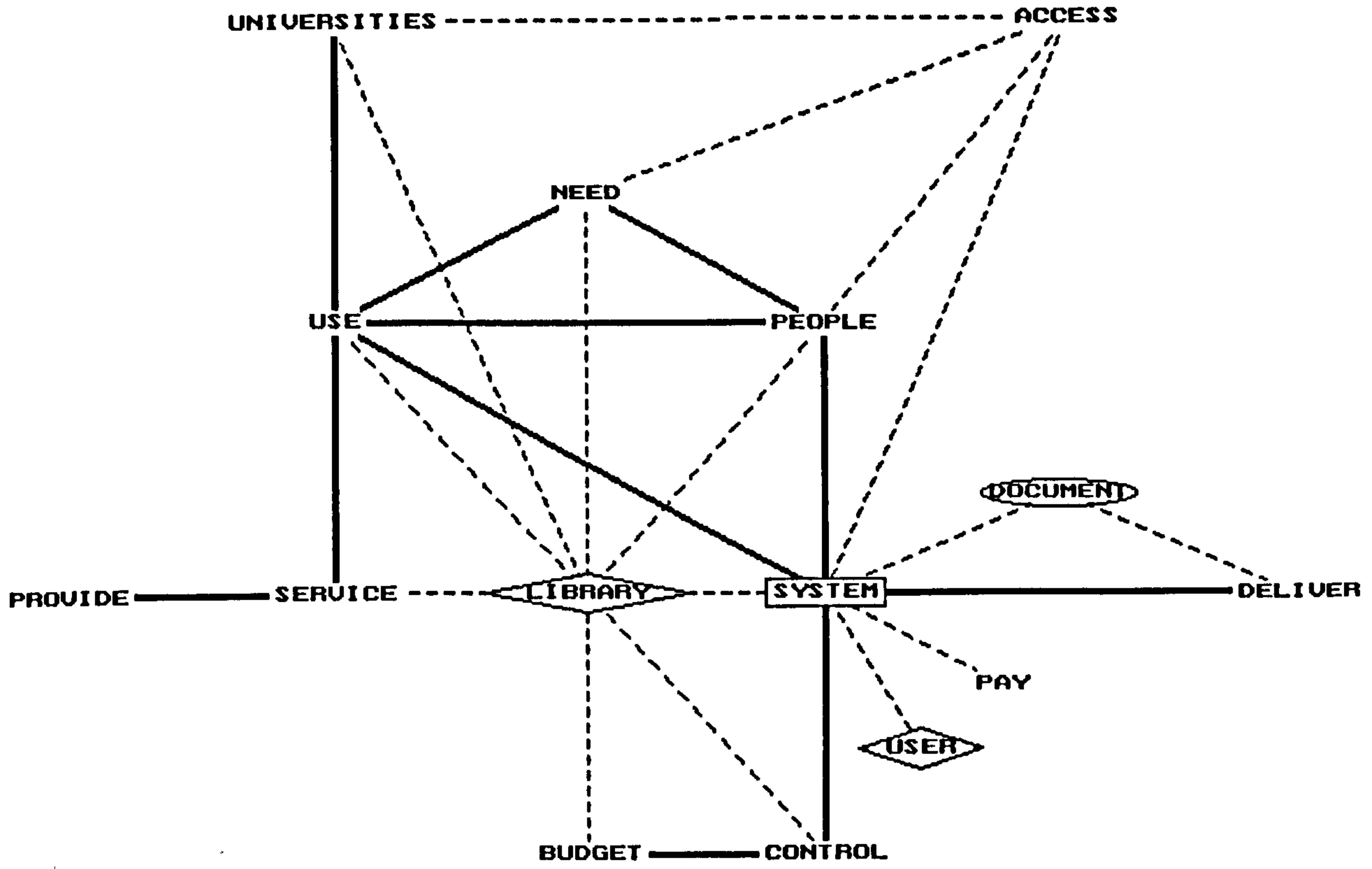


Figure 106: Whole information professional corpus - Leximappe D
 Seed pair {Electronic-Print} S = 0.10
 Minimum S for internal links = 0.048 Minimum S for external links = 0.050

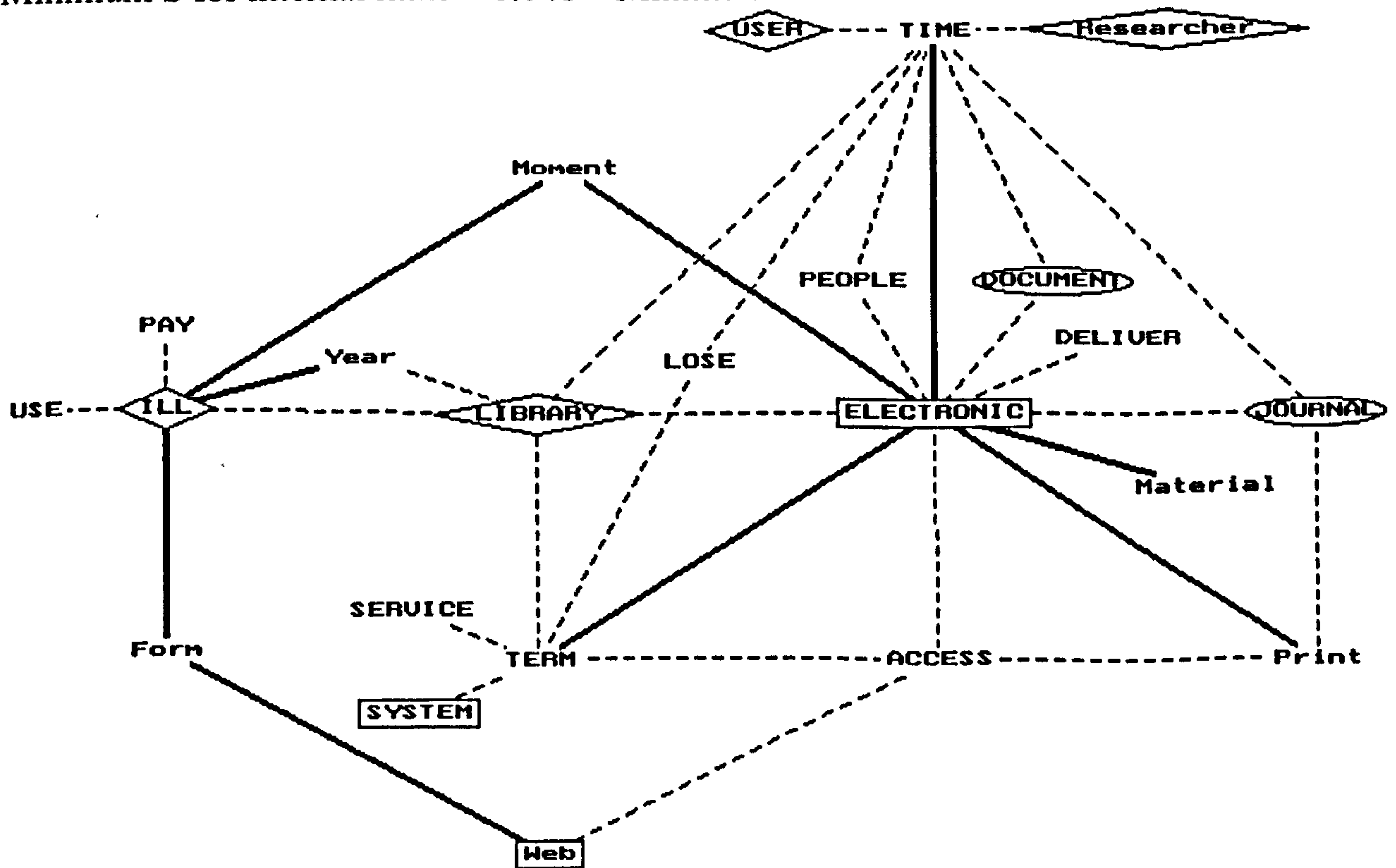


Figure 107: Whole information professional corpus - Leximappe E

Seed pair {Electronic-Print} S = 0.10

Minimum S for internal links = 0.038 Minimum S for external links = 0.050

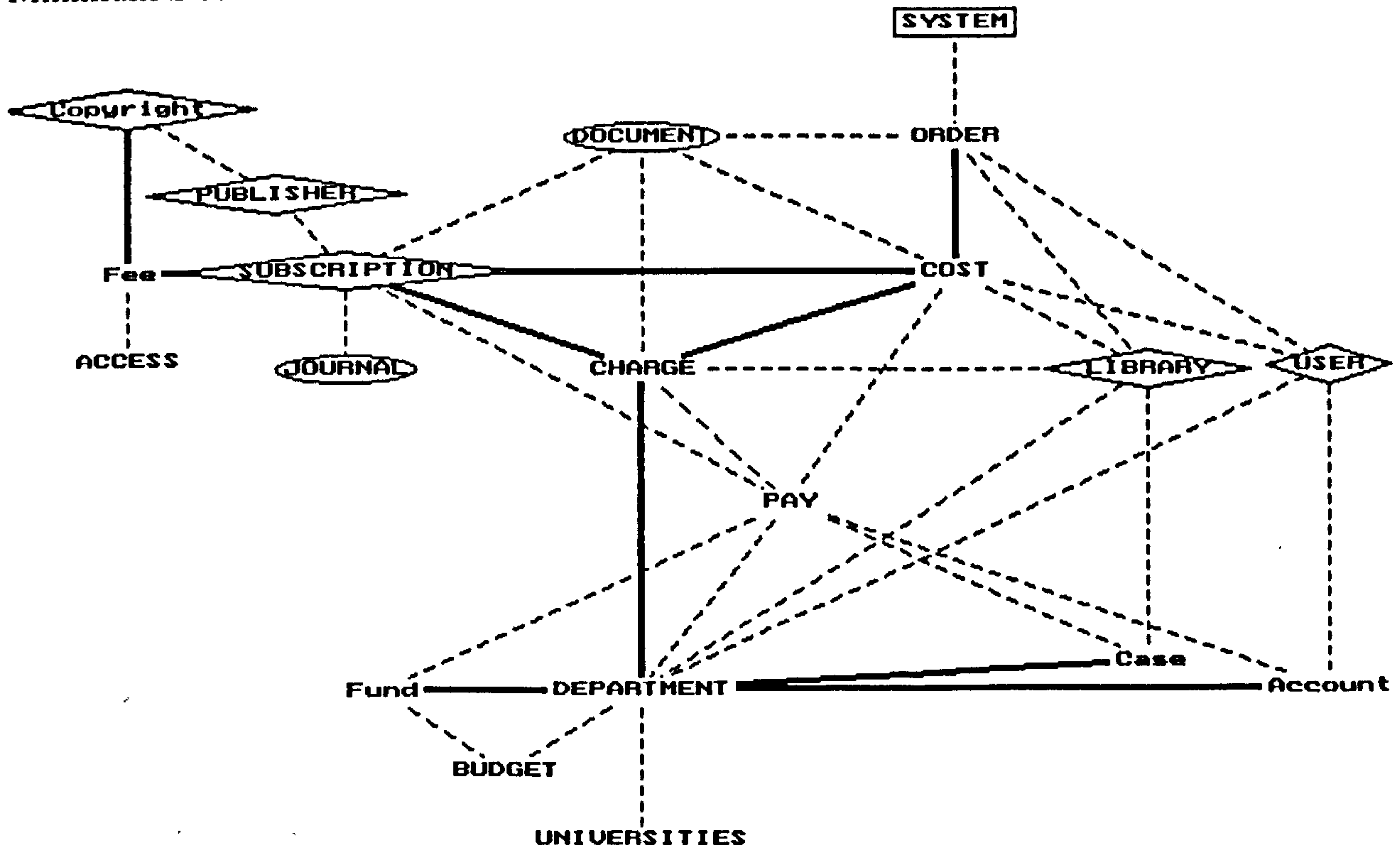


Figure 108: Whole information professional corpus - Leximappe F

Seed pair {Money-Spend} S = 0.10

Minimum S for internal links = 0.031 Minimum S for external links = 0.050

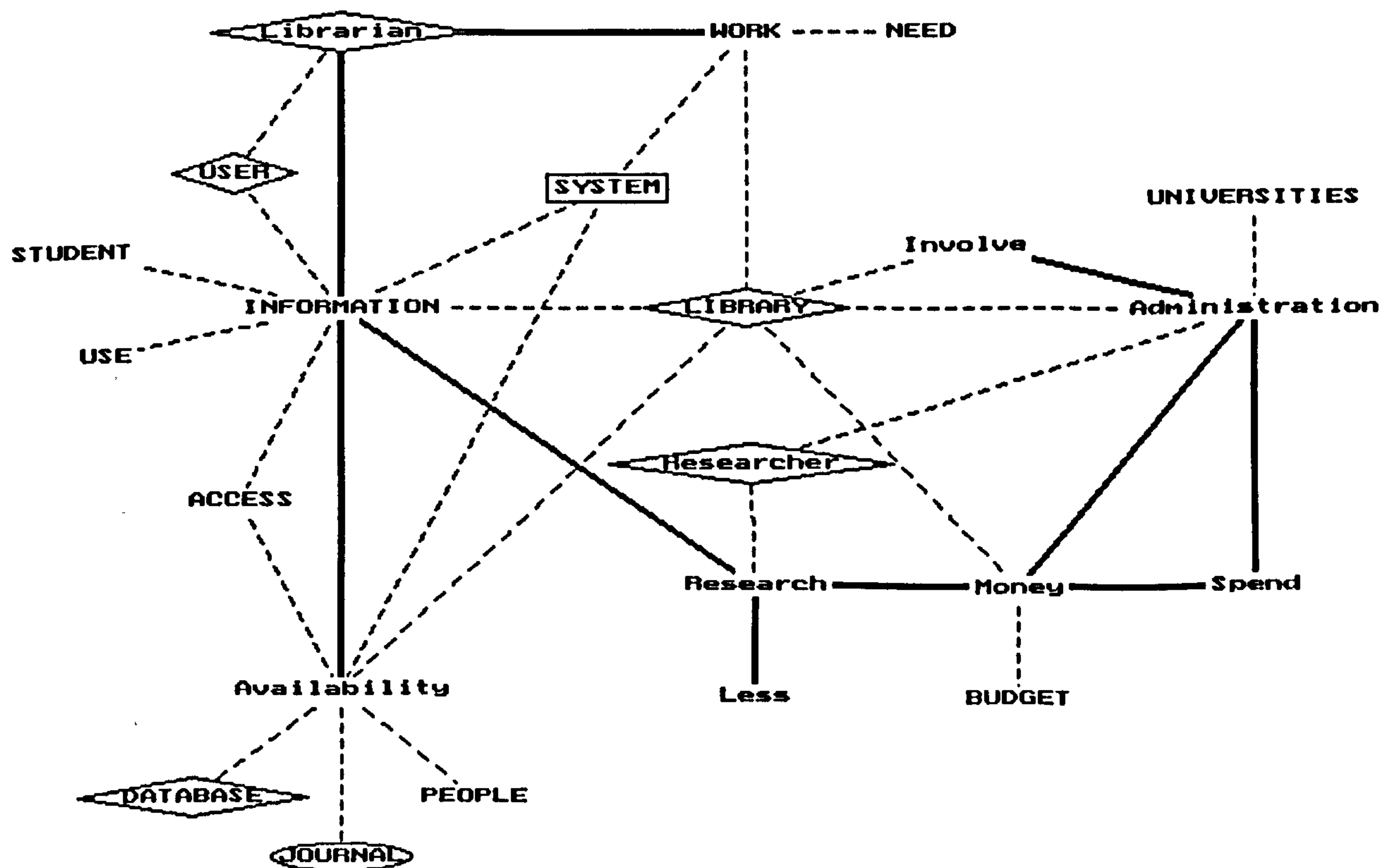
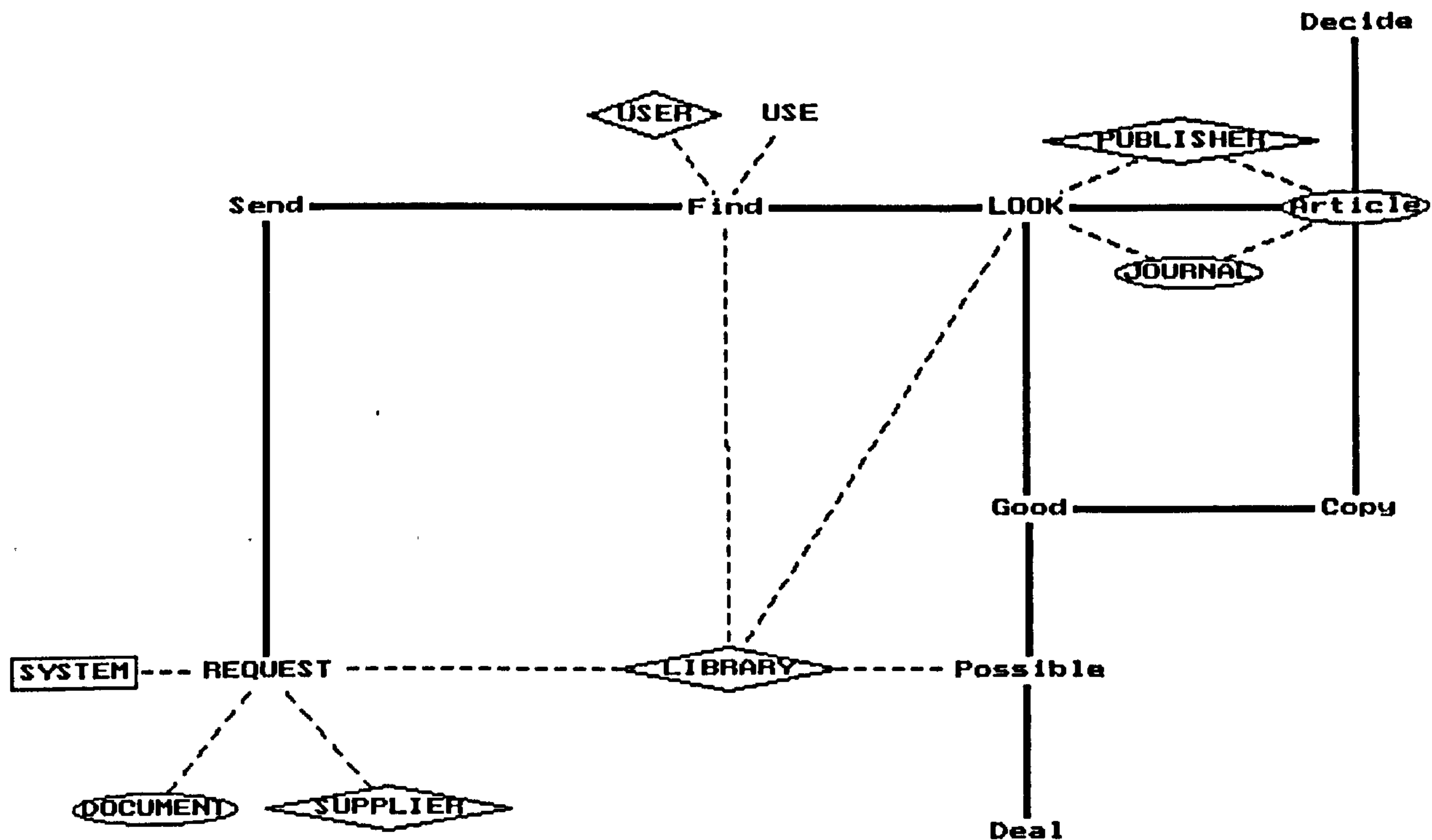


Figure 109: Whole information professional corpus - Leximappe G

Seed pair {Request-Send} S = 0.073

Minimum S for internal links = 0.026 Minimum S for external links = 0.050



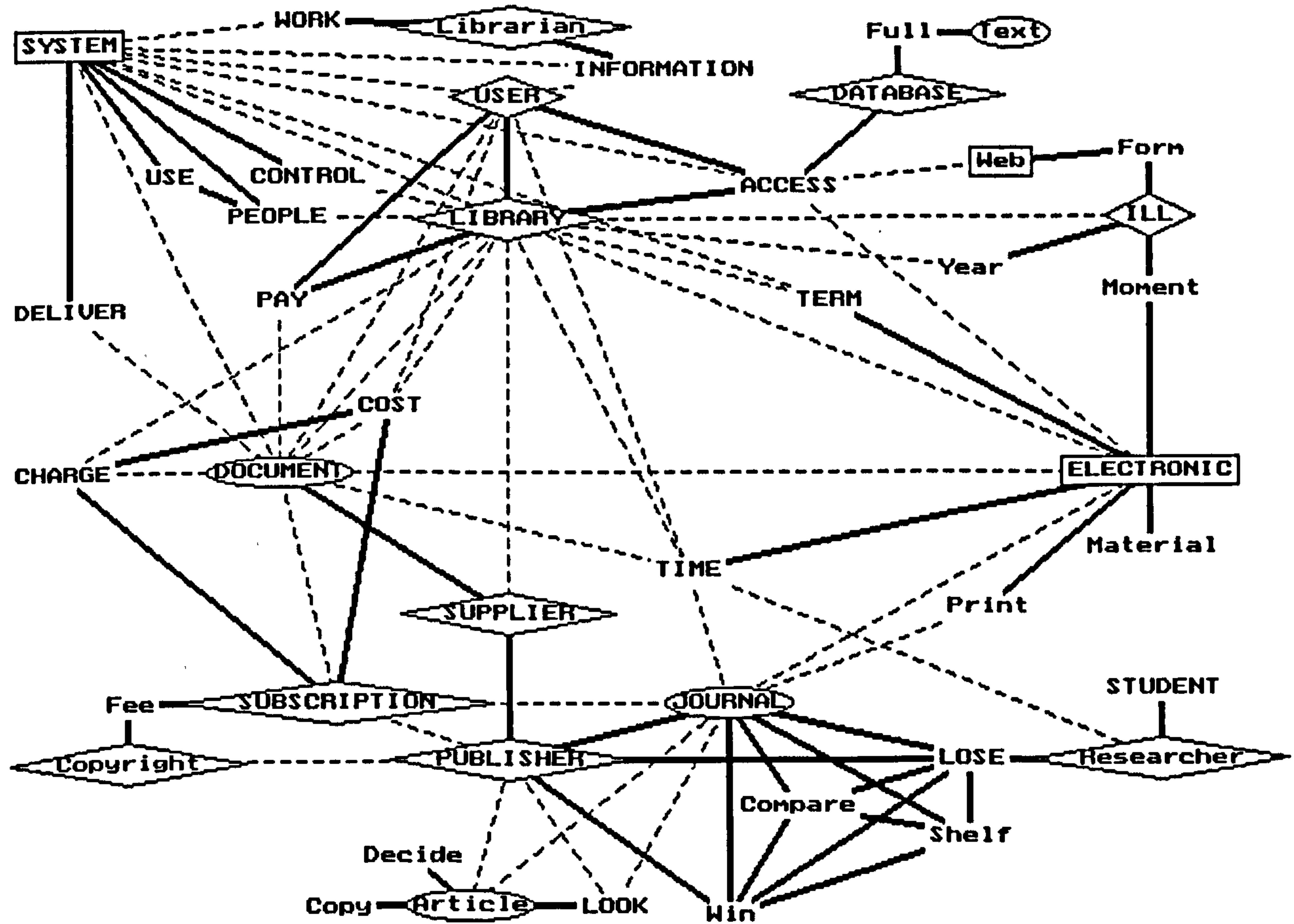
Comparing these leximappes with the global network diagrams, Figures 100-102, we can see that Leximappe A covers much of the main network in Figure 100, including the dyads associated with the interview schedule {Expect-Pay} and {Regulate-Access}. However, the idiomatic dyad {Full-Text} is linked into this network via {Database-Access}. The central position of 'Library' is clear. Leximappe B shows the secondary network from Figure 100 as highly linked internally, which should be no surprise given that it, too, is associated with a question from the interview schedule. Interestingly, 'Document', which links this question into the main network in Figure 101, is shown as having a large number of external links in Leximappe B, reinforcing the suggestion that it is a term that links a number of subnetworks. Apart from indicating the central position of 'Library', Leximappe C suggests that the cluster {Provide-Service-Use-People} from Figure 101 is linked with 'System', 'Budget' and 'Deliver'. From Leximappe D onward, the leximappes detail the co-word network at threshold levels that are largely below that of Figure 101. All of them reinforce the finding from Figures 100-102 that 'Library' is a central word in the interviews. Leximappe D contains two of the three technology words

included in the leximappe series, 'Electronic' and 'Web', although they are not adjacent in the diagram. Although external to Leximappe E, 'Pay' is clearly the subject, and it links 'Department' with financial issues such as {Order-Cost} and, via {Subscription}, with {Copyright-Fee}. Leximappe F contains clusters concerning campus finance {Administration-Money-Spend}, linked via 'Research' to {Information-Availability} and thereby to {Librarian-Work}. Leximappe G can be read as a description of information retrieval (Find-Look} and access methods including {Send-Request} and {Article-Copy}.

Overall, and in common with the global association diagrams in Figures 100 and 101, words representing the category of the information chain were more common than those representing either scholarly communication or technology. They were, however, scattered throughout the leximappes, with few obvious major clusters besides those influenced by the interview schedule (for example, Leximappe B). In order to investigate further the composition of the three categories and their relation to each other, a synthesis diagram was generated according to the principles outlined in the methodology section. This is shown in Figure 110.

Synthesis

Figure 110: Whole information professional corpus - Synthesis diagram



Once again, 'Library' is in a central position. Significant other poles in the network appear to be 'System', 'Electronic' 'Journal', 'Publisher' and 'Document'. This is not an accident of layout but has occurred because of the inter-linking within and between the three sets of category words. There are two main groups of information chain words, around 'Publisher' and 'Library'. One includes 'Copyright', 'Subscription' and 'Supplier', the other includes 'Library', 'User' and 'Librarian'. In different ways, these form semantic pathways between 'Publisher' and 'Library'. Another way of thinking about these is as mutual definitions. For example, 'Copyright' and 'Subscription' identify a pathway (or mutual definition) that is largely financial, including 'Fee', 'Cost'

and 'Charge'. We can say, then, that the main definition of the information chain (as specified by the category words) operated in the interviews as a whole as a relationship between publishers and libraries. This may seem to be saying very little, since that definition mirrors closely the usual understanding of the information chain that was used to select the category words in the first place. However, this would be to use a realist rather than a relativist (in this case, semiotic) interpretation of what is meant by definition. What is being identified in Figure 110 is not a state of the world but a state of discourse. In the usual, realist, definition of the conventional information chain, researchers (except in their role as authors) do not come between publishers and libraries. However, Figure 110 shows that in terms of the discourse of the interviewees, researchers were one way in which publishers and libraries were mutually defined. Unfortunately, the details of this aspect of the definition are not wholly clear from Figure 110 (although they could be reconstructed by using the co-word network to relevance-rank speech turns from the interview transcripts (McGreevy 1998)). The principle, though, is established.

Although small in number, technology words 'System' and 'Electronic' are in prominent positions, reflecting their central positions in Leximappes C and D (Figures 105 and 106). The former is associated with what might be called operational issues ('Use', 'User', 'Work', 'Control'), whereas the latter is associated with temporal issues ('Moment', 'Term', 'Time'). However, 'System' and 'Electronic' are not closely related, either to each other or to the remaining technology word, 'Web'. Rather, the operational and temporal words respectively form mutual definitions of 'System' and 'Electronic' with respect to 'Library', not to each other. We can say, then, that the definition of technology used to generate the category of words was not in play as a discrete entity in the interview transcripts.

Scholarly communication words are also fragmented and, again, two of them ('Journal' and 'Document') are prominent poles in Figure 110. From the perspective of the information chain, they are each the focus for one mutual definition of publishers and libraries, 'Journal' being linked into a cluster representing Question 5 from the interview schedule and 'Document' being enmeshed in the financial definition noted above.

In terms of the other boundaries between the categories, that between scholarly communication and technology is principally via 'Electronic', and that between the information chain and technology is focused around the 'Library' pole of the information chain, rather than the 'Publisher' pole.

In summary, the co-word networks of the interview corpus as a whole are heavily influenced by the questions from the interview schedule, and several distinct clusters of words can be identified with specific questions. However, there was sufficient additional information in the co-word matrix to allow conclusions to be drawn apart from this. The central position of 'Library' was perhaps the most important of these. This formed one half of the major axis that defined the information chain in the interview corpus, the other being 'Publishers'. These two words were related in a number of ways, and these could be understood as mutual definitions that involved scholarly communication more than technology. Such an approach was not available in the case of the definition of technology, which was dominated by the mutually dissociated terms 'System' and 'Electronic'. These were each involved in mutual definitions with 'Library', but not with each other. These formed what might be called the boundary regions between the two categories of the information chain and technology. Apart from the central position of 'Library', perhaps the most obvious feature of the leximappes was the prevalence of financial issues, with words such as 'Pay' and 'Budget' scattered across several networks.

The analysis of the interview corpus as a whole was undertaken firstly to give an overall view of the discourse in the interviews and, secondly, to act as a benchmark or average against which the analyses of the interviews with people from different sectors of the information chain could be compared. It is to these analyses that we now turn.

Interviews with those working in academic libraries

This section is concerned with the corpus that is defined as those interviews that were with people working in academic libraries, which amounted to 19 interviews. Because this was over half of the corpus as a whole, it was expected that there would be few major differences between the findings relating to this corpus and those relating to the corpus as a whole. The results are given in the following order:

- Graphical estimation of the core words used most frequently;
- Global network showing the overall distribution of the words in the interviews according to the S (association) and the I (inclusion) indexes;
- Leximappes for the interviews with those working in academic libraries;
- Synthesis of leximappes to show ‘information chain’ , ‘scholarly communication’ and ‘technology’ networks in relation to each other.

Graphical estimation of the core

A core of words for each corpus was estimated from the Bradford-like distribution of the prompt words for each corpus. The non-linear section of the graph for the librarian corpus included all words ranking above Log 3.5, which gave a core of words as follows:

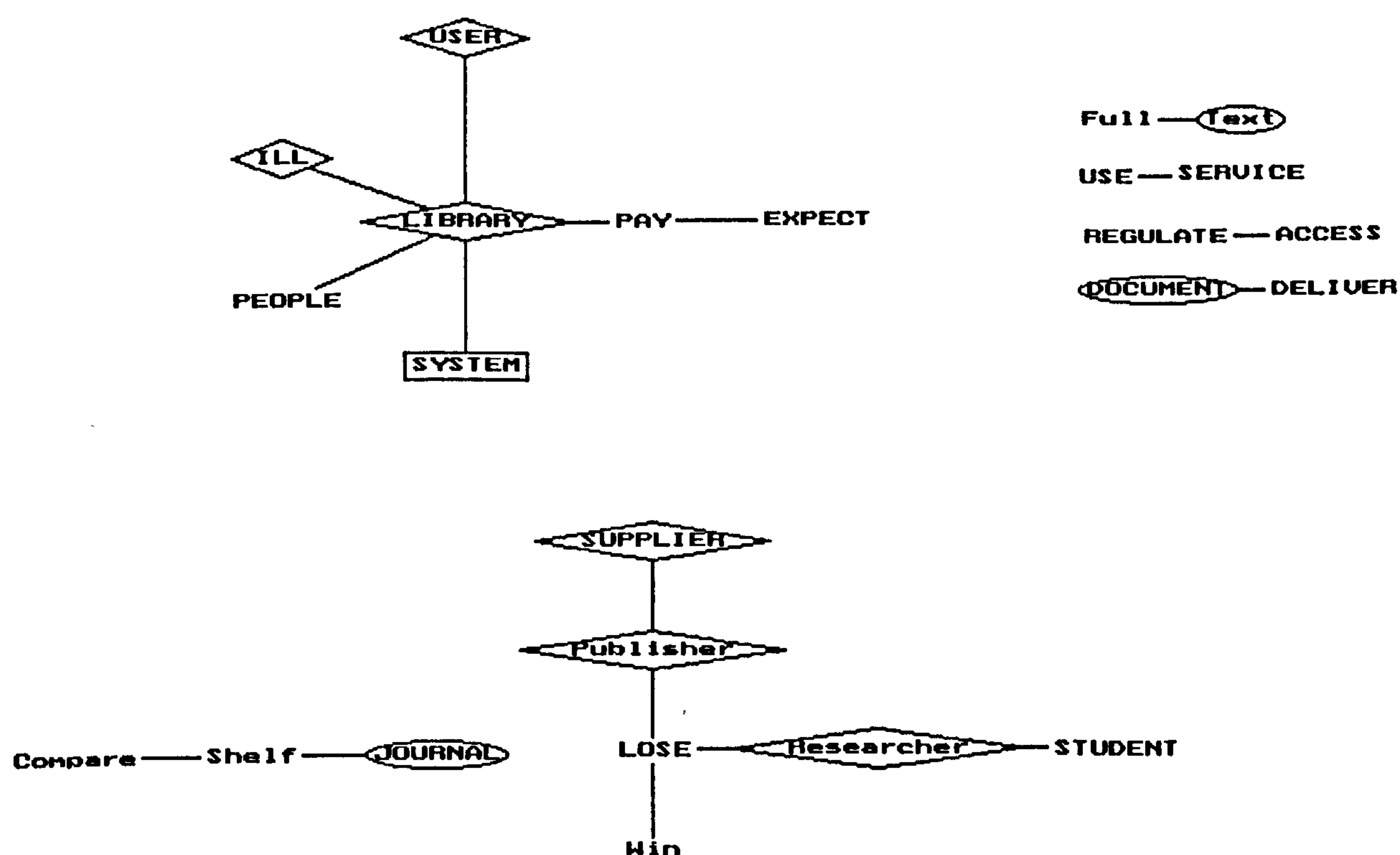
LIBRARY, ACCESS, SYSTEM, PAY, USER, PEOPLE, USE, DOCUMENT, SUPPLIER, SERVICE, NEED, DEPARTMENT, JOURNAL, DATABASE, STUDENT, ILL, INFORMATION, CHARGE, UNIVERSITIES, WORK, TIME, MOMENT, DELIVER, TERM, ELECTRONIC, EXPECT, LOSE, REGULATE, BUDGET, PROVIDE, LOOK, MONEY, ORDER.

Global network diagrams

The global association network diagram for the librarian interview corpus is shown at two threshold values of the association index in Figures 14 and 15.

Figure 111: The global association network diagram from the librarian interview corpus (1)

(threshold $S = 0.16$)



I laid out this diagram to aid comparison with Figure 100, relating to the corpus as a whole. At this high threshold value of the association index we can see that the two are very similar. As in Figure 100, one main network is centred on 'Library'. The second network from Figure 100 (which represents Question 5 from the interview schedule) is split into two in Figure 111 at this resolution. However, overall we can say that, as expected, the association network for the interviews with those working in academic libraries is broadly similar to that for the interview corpus as a whole. If we increase the detail by decreasing the threshold value, we get Figure 112. I have tried in Figure 112 to

maintain some of the layout of Figure 111 so that it is possible to see how Figure 112 has grown from Figure 111. I have also tried to follow the layout of Figure 101, so that comparisons can be drawn with the interview corpus as a whole.

Figure 112: The global association network diagram from the librarian interview corpus (2)
(threshold $S = 0.12$)

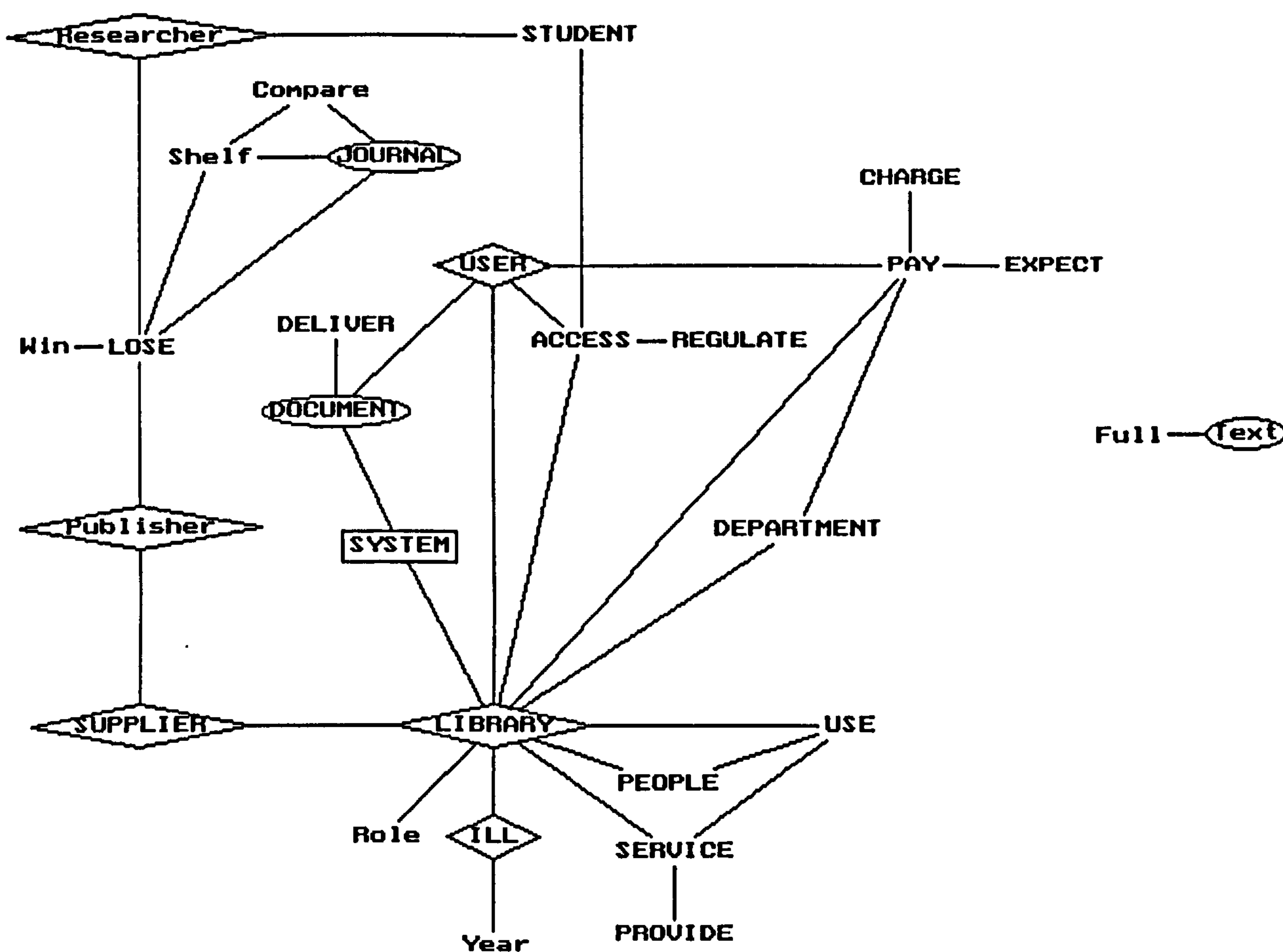


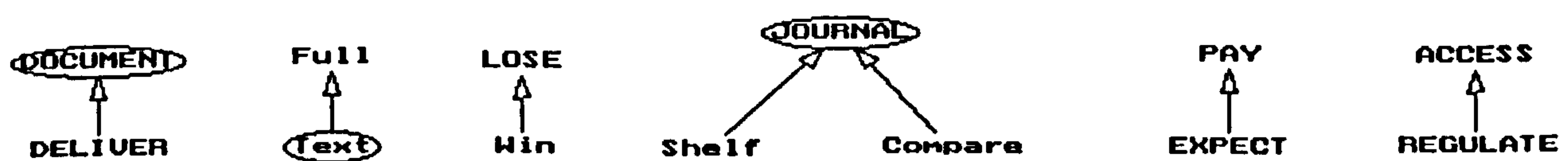
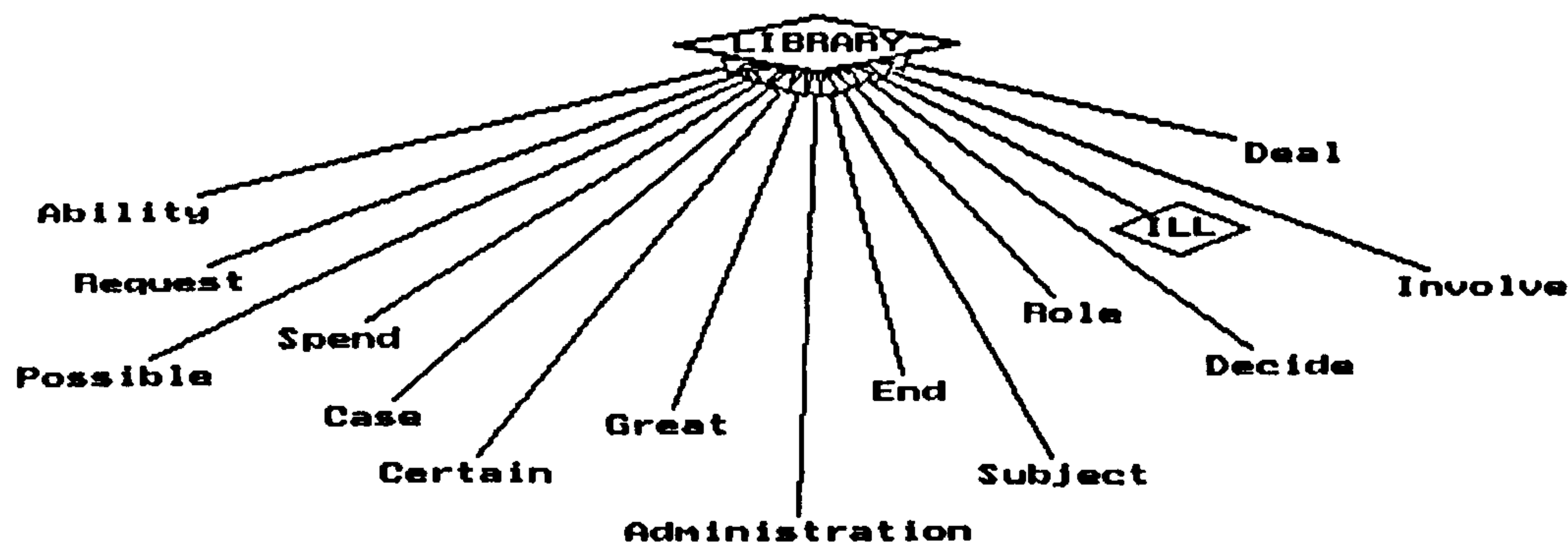
Figure 112 is very similar to Figure 101, the equivalent diagram for the whole information professional interview corpus. 'Library' is more central than it was in Figure 111, and is the focus of the main network. This consists of perhaps four main regions:

- {People-Use-Service-Provide};
- {Regulate-Access-User-Student};
- {Document-Deliver-System};
- {Expect-Pay-Charge-Department}.

In addition, there are several individual words linked to 'Library'. The secondary network from Figure 111, representing Question 5 from the interview schedule, is linked into the main network via {Publisher-Supplier}. {System-Library} is the only point of contact between words in the categories of technology and the information chain. All these features are similar in both Figure 101 and Figure 112. There are, however, some differences, mostly perhaps around 'Student'. Firstly, whereas in Figure 101 the second link between the two networks in Figure 100 was via 'Document', in Figure 112 it is via {Researcher-Student}. Secondly, whereas the {Regulate-Access} cluster (which represents Question 2 from the interview schedule) was linked in Figure 101 to 'Database' and 'Information', in Figure 112 it is linked to {Student-Researcher}. This increase in the prominence of {Researcher-Student} when compared with the interview corpus as a whole suggests that the librarians were taking a more user-centred view of the interview questions than was typical in other interviews. This would need to be confirmed by comparison with equivalent network diagrams representing those other interviews (see below). The absence of 'Copyright' and 'Database', and 'Electronic', from Figure 112 when compared with Figure 101 suggests that both information chain words and those standing for the category of technology were less prominent in the interviews with librarians than was typical.

For an alternative view of the actor-networks in play in the interviews with academic librarians, an inclusion diagram was constructed and is shown in Figure 113.

Figure 113: The global inclusion network diagram from the librarian interview corpus
(threshold I = 0.7)



Once again, Figure 113 is very similar to the equivalent diagram for the whole information professional interview corpus, Figure 102. The position of 'Library' as the major centre of translation in the discourse of those working in academic libraries is confirmed, with other hierarchical relationships between words largely limited to idiomatic dyads such as {Full-Text} or excerpts from interview questions such as {Pay-Expect}. Once again, the variety of words included in the 'Library' actor-network is striking, although the words are more ambiguous than in Figure 102. Thus, it is not possible to give a simple breakdown of the words according to conventional categories such as the organisational or the temporal. It is not clear what conclusions might be drawn from this, except perhaps to note that 'Library' must appear different from the inside than it does from the outside, perhaps being more differentiated and less easy to define as a whole. Intuitively, this would make sense.

It was difficult to infer much more from the global network diagrams for the librarians interview corpus. Certainly, the second level of analysis, how clusters linked to each other, was difficult from only the global network diagrams. However, a finer-grained analysis was possible using the leximappe procedure, and the results of this are discussed below.

Leximappes

A series of leximappes were produced for the librarian corpus, as described in the methodology section above, and these offered a way of focusing attention on how semantic clusters were related to each other.

Figure 114: Librarian interview corpus - Leximappe A

Seed pair {Full-Text} S = 0.63

Minimum S for internal links = 0.082 Minimum S for external links = 0.11

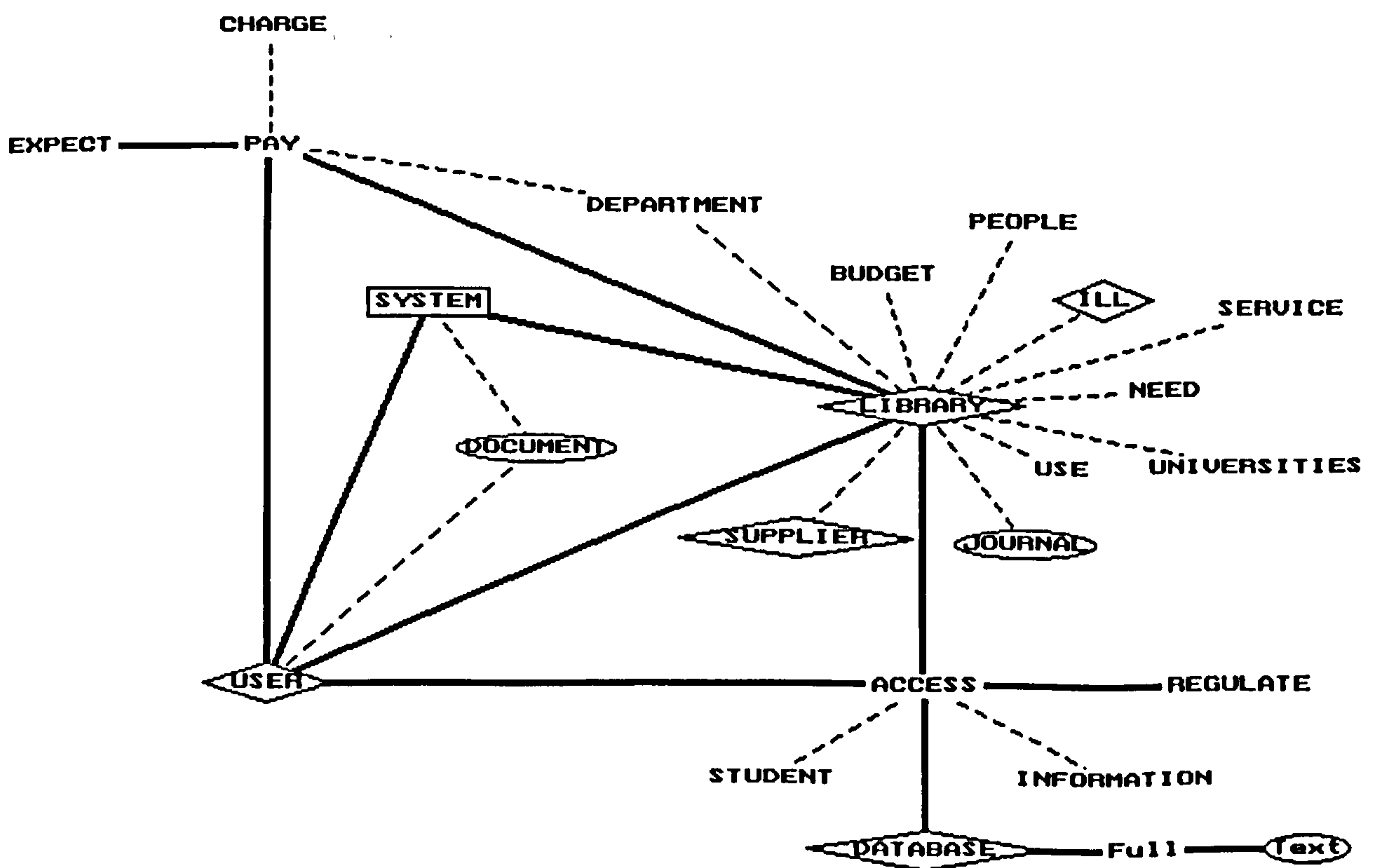


Figure 115: Librarian interview corpus - Leximappe B

Seed pair {Document-Deliver} S = 0.35

Minimum S for internal links = 0.012 Minimum S for external links = 0.10

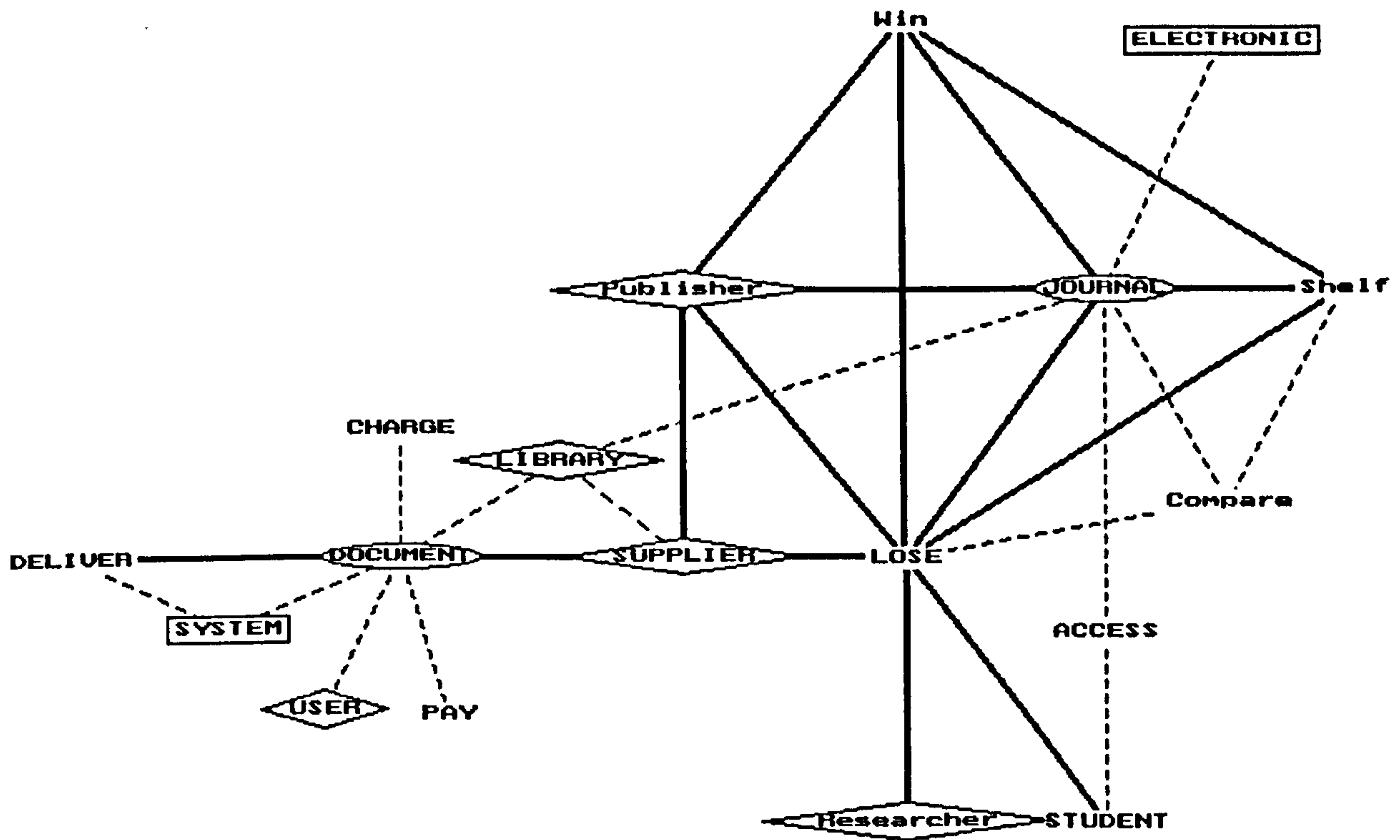


Figure 116: Librarian interview corpus - Leximappe C

Seed pair {Use-Service} S = 0.16

Minimum S for internal links = 0.090 Minimum S for external links = 0.090

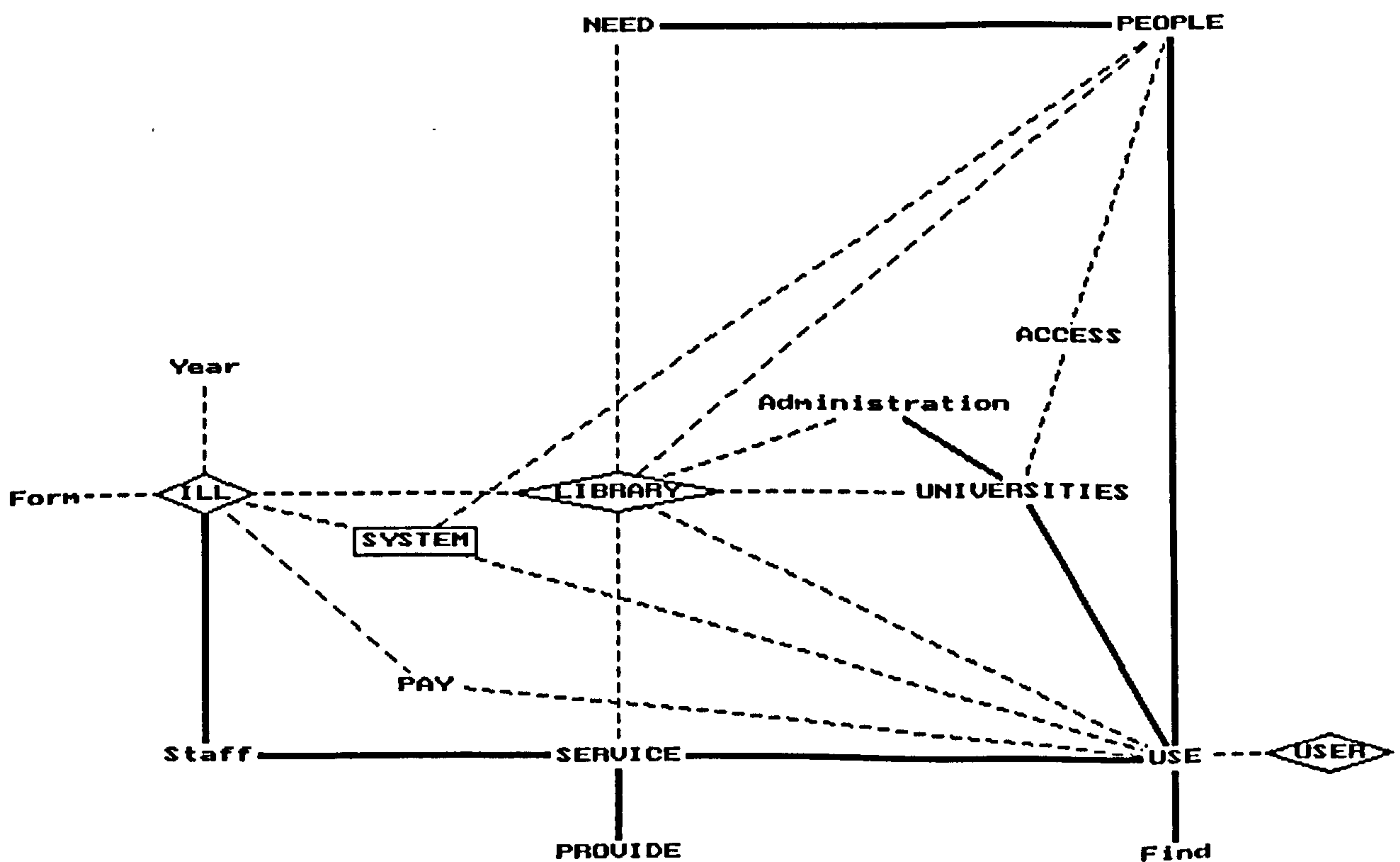


Figure 117: Librarian interview corpus - Leximappe D

Seed pair {Department-Account} $S = 0.11$

Minimum S for internal links = 0.067 Minimum S for external links = 0.080

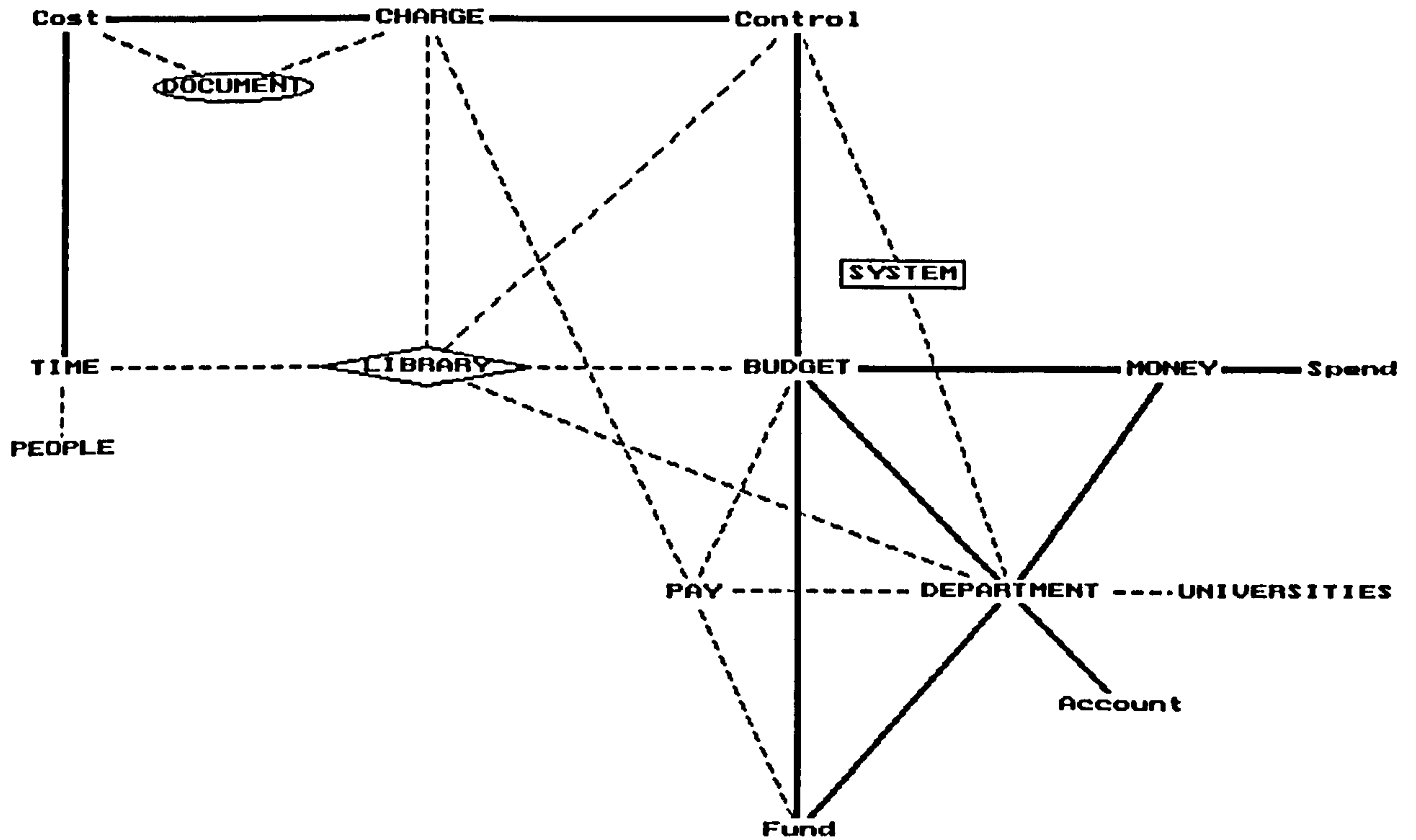


Figure 118: Librarian interview corpus - Leximappe E

Seed pair {Electronic-Print} $S = 0.094$

Minimum S for internal links = 0.058 Minimum S for external links = 0.070

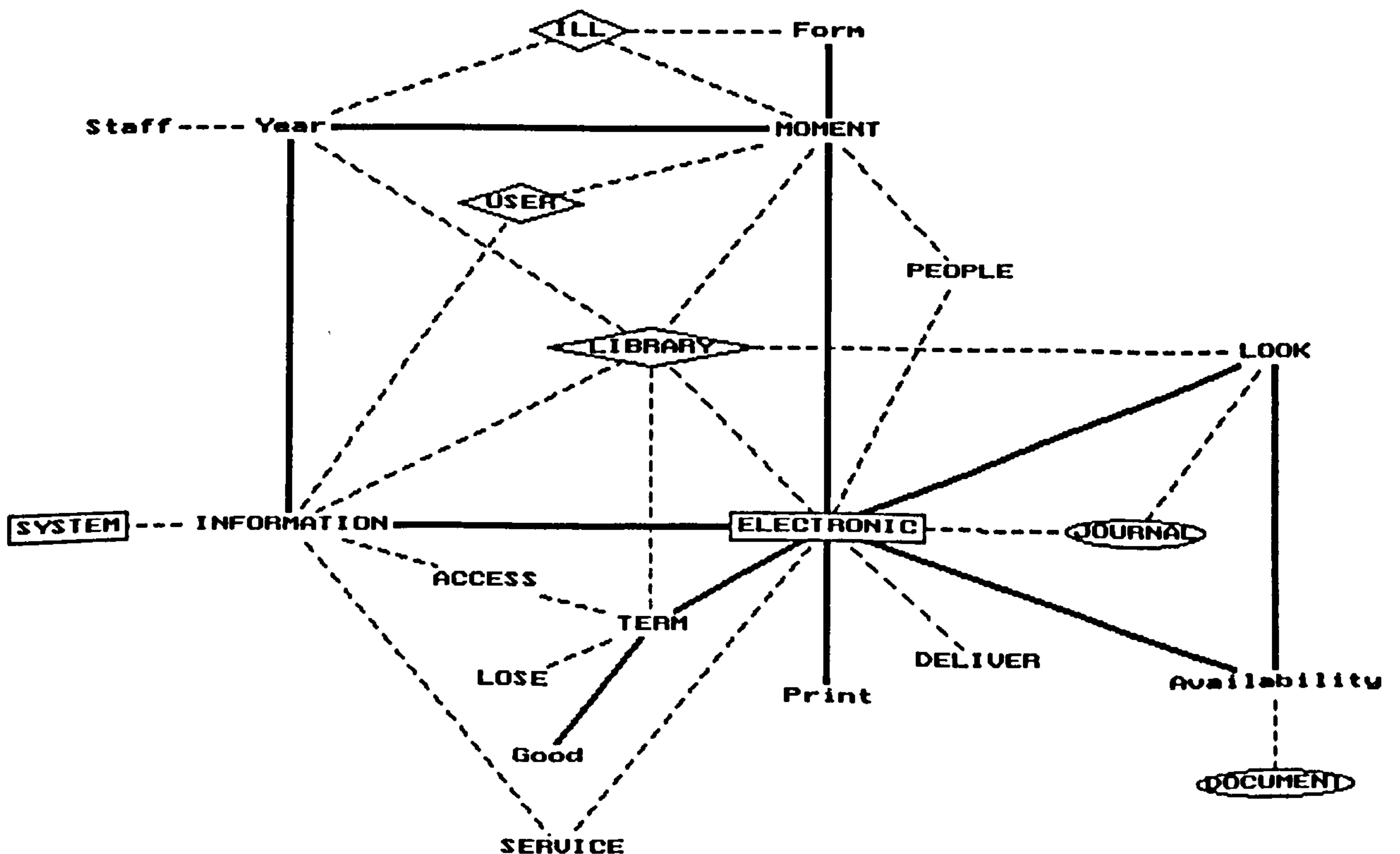


Figure 119: Librarian interview corpus - Leximappe F

Seed pair {Research-End} S = 0.078

Minimum S for internal links = 0.038 Minimum S for external links = 0.060

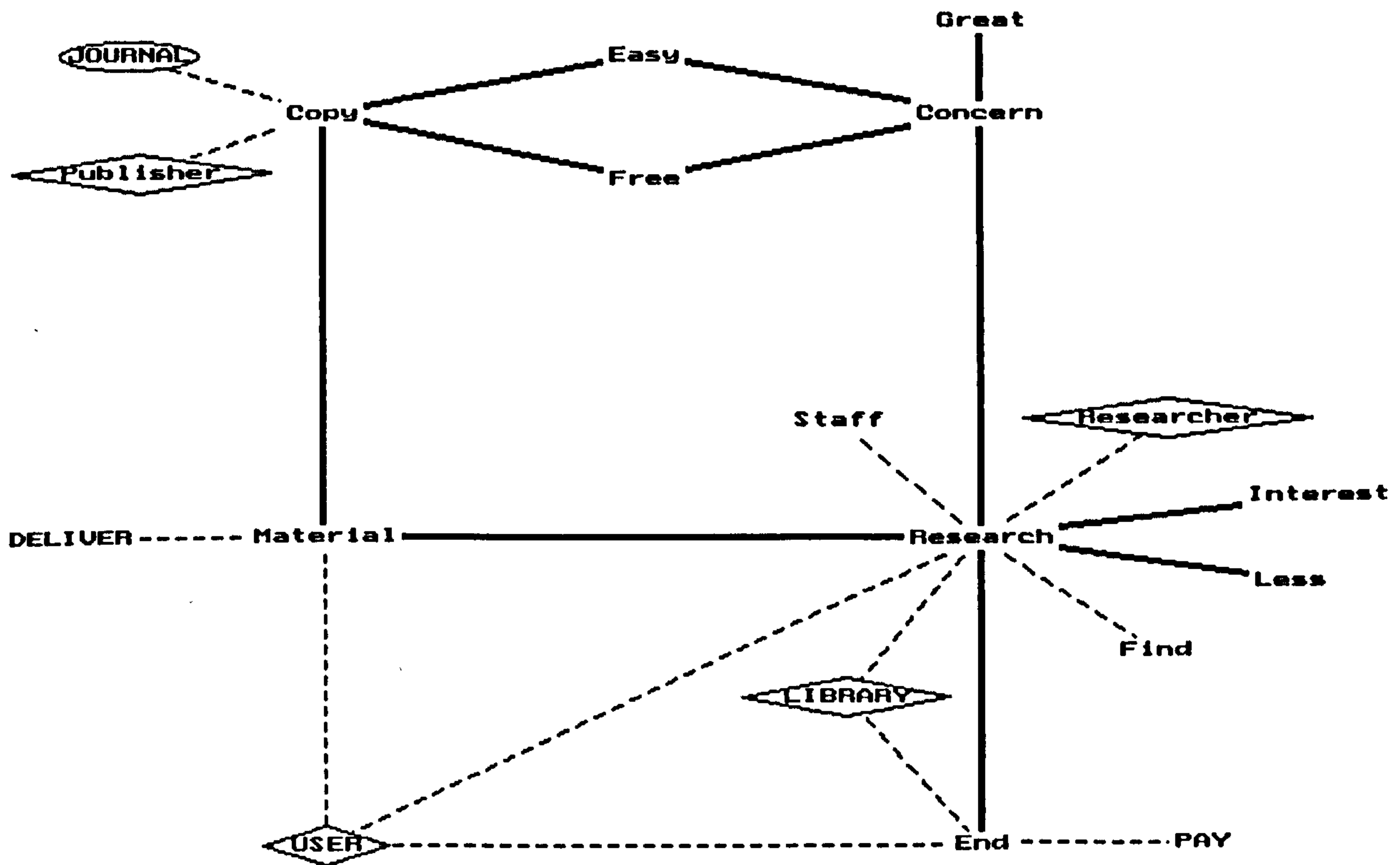
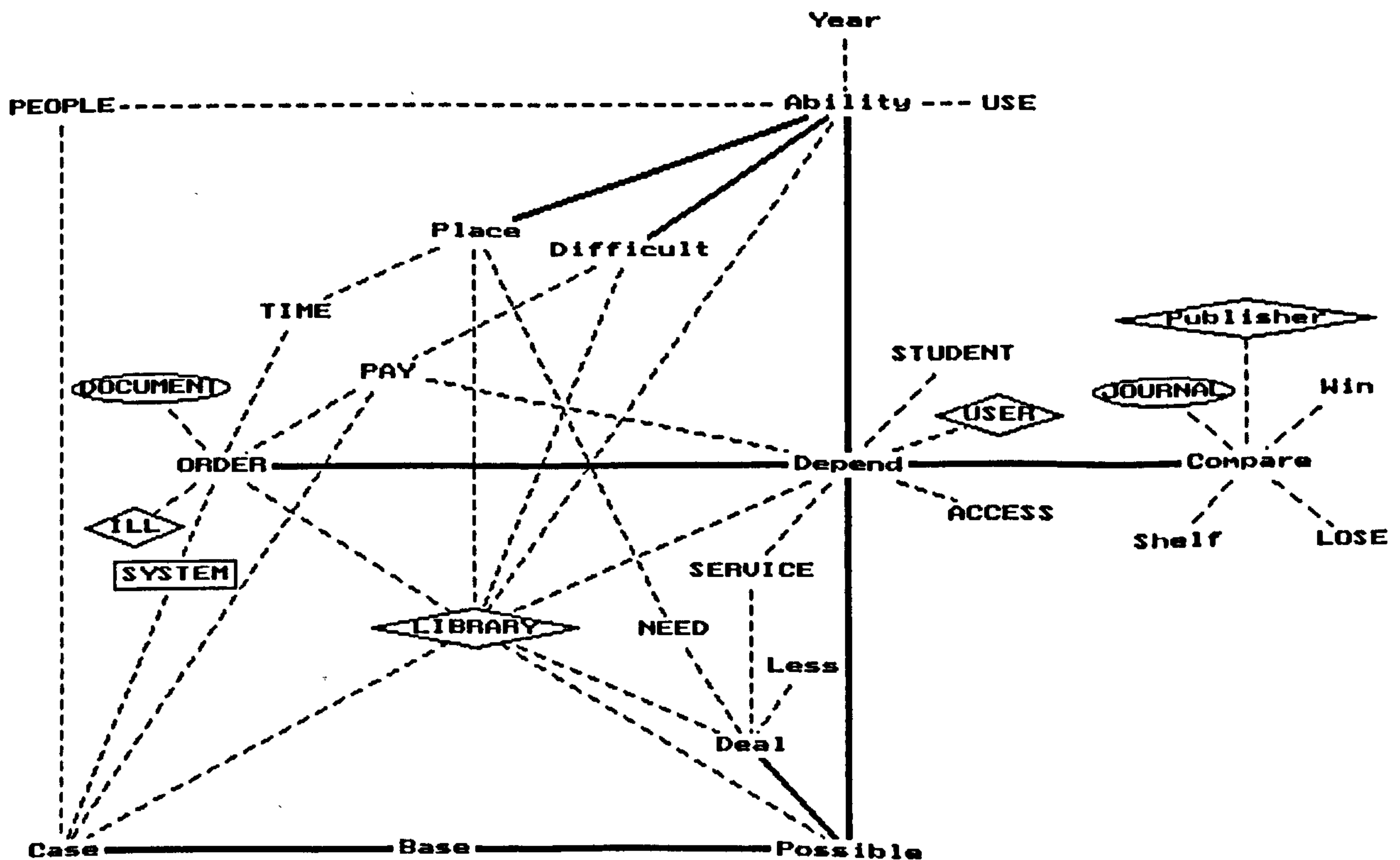


Figure 120: Librarian interview corpus - Leximappe G

Seed pair {Research-End} S = 0.066

Minimum S for internal links = 0.035 Minimum S for external links = 0.050



This series of leximappes is strongly related to the global network diagrams (Figures 103-109). Leximappe A covers the central region of Figure 112 and, like Figure 113, emphasises the central position of 'Library'. Leximappe B covers the secondary network in Figure 111 that is related to Question 5 from the interview schedule. Leximappe C covers the region to the bottom right of Figure 112 and links 'ILL' to 'Service'. Most of the remaining leximappes are below the threshold of the global network diagrams.

The first of this series of leximappes (Figure 114) is very similar to the equivalent for the interview corpus as a whole (Figure 103), confirming 'Library' as central to both corpora and linked with {User-Pay} and {Access-Database-Full-Text}. Given the numerical dominance of interviews with librarians in the interview corpus as a whole, this similarity should be no surprise. However, beyond Leximappe A (and Leximappe B, which summarises Question 5 from the interview schedule) there are differences. Leximappe C, based on {Use-Provide-Service} in both corpora, differs in the librarian interviews by the replacement of {ILL-Staff} for {Budget-Control}, the latter being a part of Figure 105 from the whole corpus leximappes. In the librarian leximappes, {Budget-Control} forms a part of Leximappe D (Figure 117), and is linked to {Department-Account}. In turn, {Department-Account} is a part of Leximappe E (Figure 107) from the whole corpus and is linked there via 'Subscription' to {Copyright-Fee}, which is not a part of the librarian leximappes. It is possible to summarise these differences as reflecting a more practical or operational perspective on the part of librarians, who link concepts such as 'Service' and 'Budget' to entities such as 'Staff' and 'Department' in a way not found in the interview corpus as a whole.

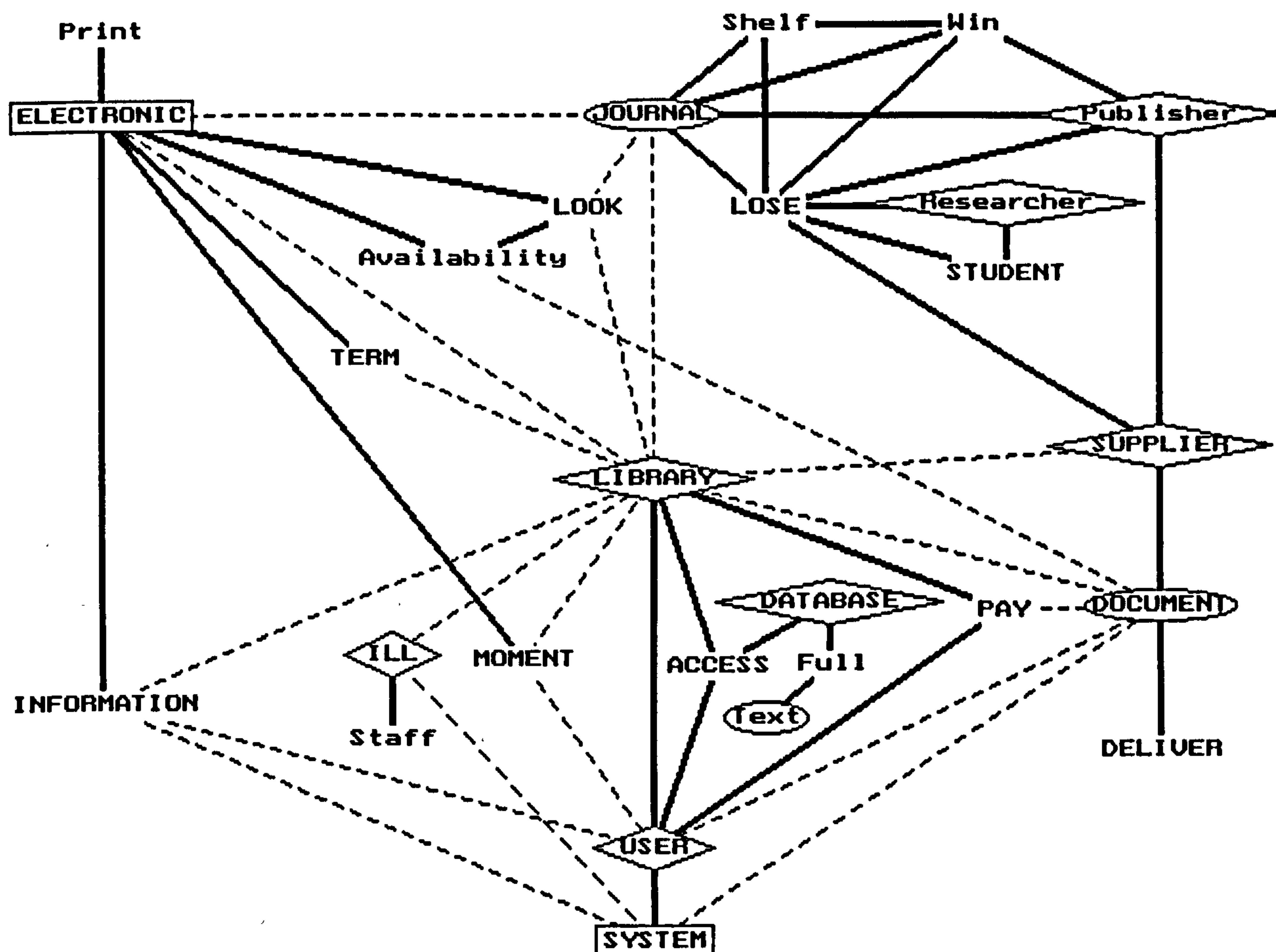
Another difference between the interview corpus as a whole and that of librarians only emerges when we consider the leximappes concerning 'Electronic'. 'Electronic' is, perhaps, the key technology word in both the whole corpus and that of librarians only, and an analysis of its position in the network is revealing. This word acts as a centre for Figure 106 (Leximappe D of the whole corpus series) and Figure 118 (Leximappe E of the librarian series). Although sharing many features, in Figure 106 the emphasis of 'Electronic' is on 'Access' to entities such as 'Document' and 'Material', whereas in

Figure 118 the emphasis is on the potential 'Availability' of an {Information-Service}. How can we understand this difference? One explanation is that this difference in the network of 'Electronic' can be understood as a part of an attempt by librarians to maintain a role for themselves in the face of the potential threat of end-user document access, that is, of disintermediation. An {Information-Service} might require management by a 'Library', whereas 'Access' to 'Documents' need not. Two other differences between the two leximappe series support this explanation. Firstly, 'Material' was linked to 'Electronic' and thereby to 'Access' in Figure 106, whereas in the librarian Leximappe F (Figure 119), it is linked to 'Copy', to {Free-Easy} and, importantly, thereby to {Great-Concern}. Here is a clearly negative evaluation of end-user access from the librarians. Secondly, if we compare the links to 'Library', in Figure 106 they include 'Electronic', 'Time' and 'ILL', whereas in Figure 118 they include 'Electronic', 'Look' and 'Information', which suggests that the latter represents a more functional than an organisational definition of 'Library'. A functional definition would be more robust against any threat of disintermediation than an organisational one.

It is difficult to see any patterns concerning the information chain or scholarly communication, as defined by the categories of words shown as diamonds and ellipses in the diagrams. A synthesis diagram was generated to link together these words into a single network view, together with those representing technology. The result is Figure 121.

Synthesis

Figure 121: Librarian interview corpus - Synthesis diagram



The information chain category is split between the region to the top right of Figure 121, which represents Question 5 from the interview schedule, and the region around 'Library' that includes 'ILL', 'User' and 'Database'. Once again, we can see that treating 'System' as a technology word is not straightforward and that 'Electronic' is the key (only) unambiguous technology word. Indeed, in principle the top left of Figure 121 could be read as a mutual definition of 'Electronic' and 'Library', although without using this definition to return to the interview transcripts themselves it is not clear what 'Term' or 'Moment' might contribute to it. Comparing Figure 121 with the synthesis diagram for the interview corpus as a whole (Figure 110), we can see that there this definition was described as temporal, and this could be one interpretation of both 'Term' and 'Moment'.

The main difference between Figures 110 and 121 is the relationship between 'Publisher' and 'Library'. In Figure 110 this constituted most of the discursive definition of the information chain, whereas in Figure 121 it comprises only 'Journal' and {Document-Supplier}. The category of the information chain is not nearly so discrete in Figure 121 and appears much more constrained by interview Question 5. We might conclude from this that the information chain as categorically defined for the purposes of the co-word analysis was not in play as a discrete category in the interviews with librarians. Such as it is, the scholarly communication category is represented in Figure 121, as in Figure 110, by 'Journal' and 'Document', as different mutual definitions of 'Library' and 'Publisher'.

In summary, the co-word networks of the interview corpus from those working in academic libraries was, as with the interviews as a whole, heavily influenced by the questions from the interview schedule, and several distinct clusters of words can be identified with specific questions. Again, though, there was sufficient additional information in the co-word matrix to allow conclusions to be drawn apart from this. 'Library' was again central, although it did not have quite the relationship with 'Publisher' that constituted a representation of the information chain as there was in the interviews as a whole. The positions of scholarly communication words were similar to those in the interviews as a whole. Technology words were represented by 'Electronic'. This and other words such as 'Budget' operated as foci for librarians to emphasise the practical (rather than scholarly) importance of the library function against any potential threat from disintermediated end-user access to material.

The 19 interviews with those working in academic libraries comprised most of the whole information professional interview corpus, and so could be expected to be most typical of that corpus. In contrast, there were only five interviews with those working at the British Library Document Supply Centre, so that we might expect the BLDSC corpus to exhibit less typicality. It is to this corpus that we now turn.

Interviews with those working at BLDSC

This section is concerned with the corpus that is defined as those interviews that were with people working at the British Library Document Supply Centre (BLDSC), which amounted to five interviews. Because this was only around 15% of the corpus as a whole, it was expected that there could be major differences between the findings relating to this corpus and those relating to the corpus as a whole. The results are given in the following order:

- Graphical estimation of the core words used most frequently;
- Global network showing the overall distribution of the words in the interviews according to the S (association) and the I (inclusion) indexes;
- Leximappes for the interviews with those working at BLDSC;
- Synthesis of leximappes to show ‘information chain’, ‘scholarly communication’ and ‘technology’ networks in relation to each other.

Graphical estimation of the core

A core of words for the BLDSC corpus was estimated from the Bradford-like distribution of the prompt words for each corpus. The non-linear section of the graph included all words ranking above Log 3.7, which gave a core of words as follows:

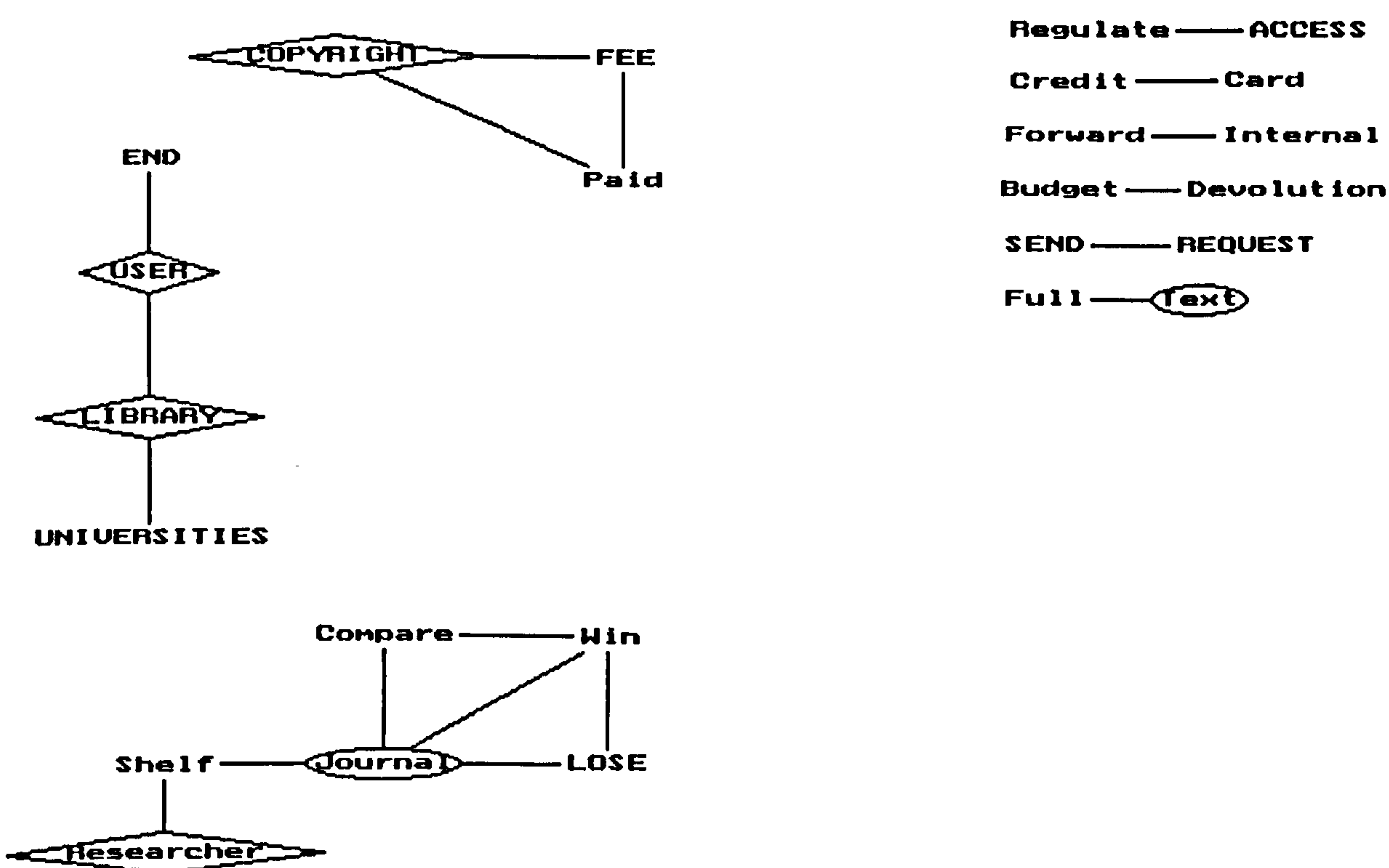
LIBRARY, SYSTEM, DOCUMENT, USER, ACCESS, END, PEOPLE, UNIVERSITIES, DATABASE, PAY, USE, CONTROL, SUPPLIER, DEPARTMENT, NEED, COPYRIGHT, FIND, ACCOUNT, SEND, PUBLISHER, CHARGE, DELIVER, ORDER, WORK, QUESTION, REQUEST, SERVICE, TIME, BIT, FEE, EXPECT, SUBSCRIPTION, WEB, ELECTRONIC, TERM, CASE, DEPEND, LOSE, ROLE, AVAILABILITY.

Global network diagrams

The global association network diagram for the BLDSC interview corpus is shown at two threshold values of the association index in Figures 122 and 123.

Figure 122: The global association network diagram from the BLDSC interview corpus (1)

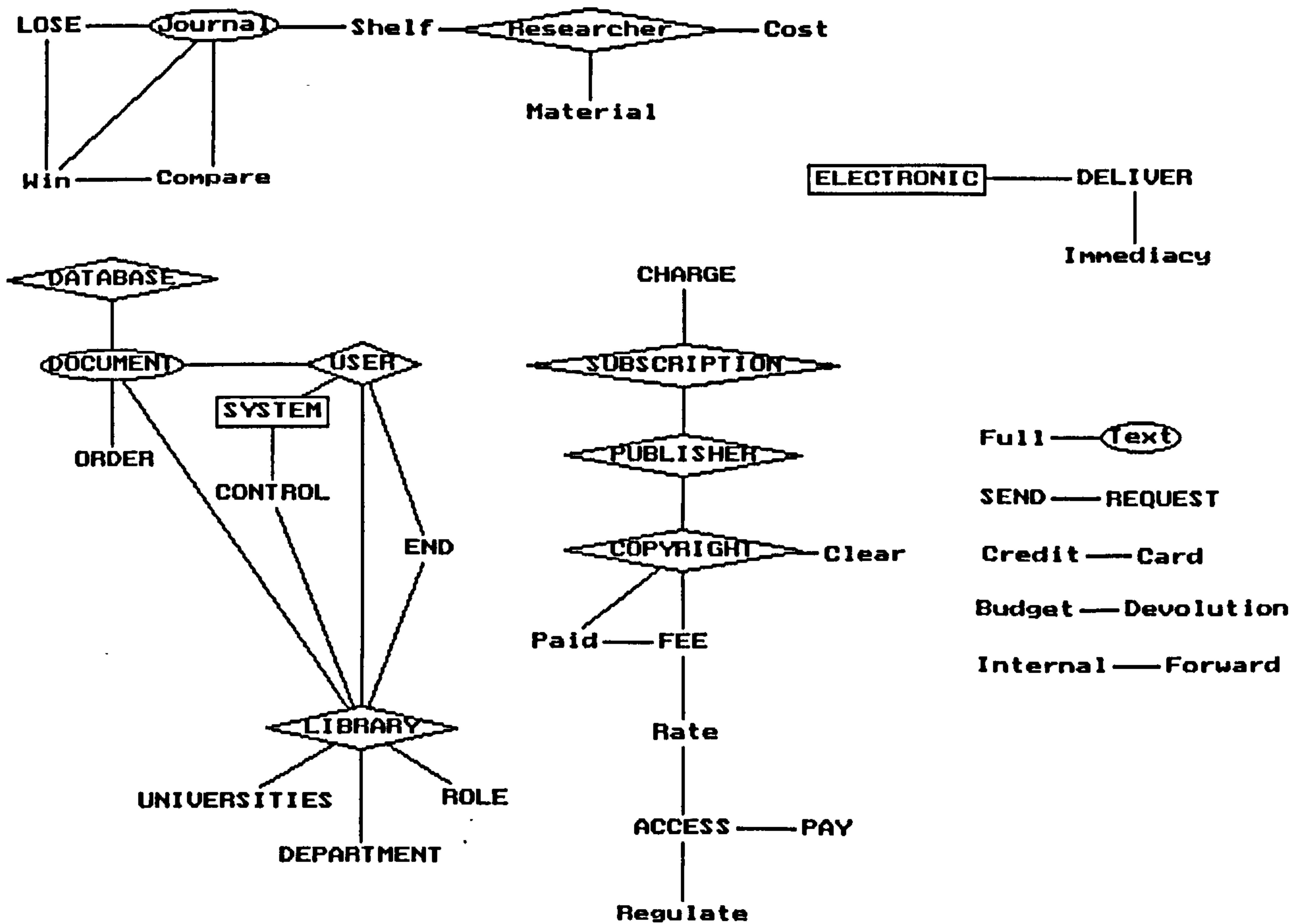
(threshold $S = 0.20$)



At this high threshold value of the association index it appears that the association network representing the BLDSC corpus contains both similarities and differences to those representing both the librarian corpus (Figure 111) and the interview corpus as a whole (Figure 100). Firstly, there are again two main clusters, one that contains 'Library' and one that appears to be based on Question 5 from the interview schedule. However, the 'Library' cluster is smaller than that of the librarian corpus and much smaller than that of the interview corpus as a whole. Conversely, there are more dissociated dyads in Figure 122 than in Figures 111 and 100. If we increase the detail by decreasing the

threshold value, we get Figure 123. Again, in Figure 123 I have tried to maintain some of the layout of Figure 122, and of Figures 101 and 112 so that comparisons can be drawn with the interview corpus as a whole and with the librarian corpus.

Figure 123: The global association network diagram from the BLDSC interview corpus (2)
(threshold $S = 0.15$)



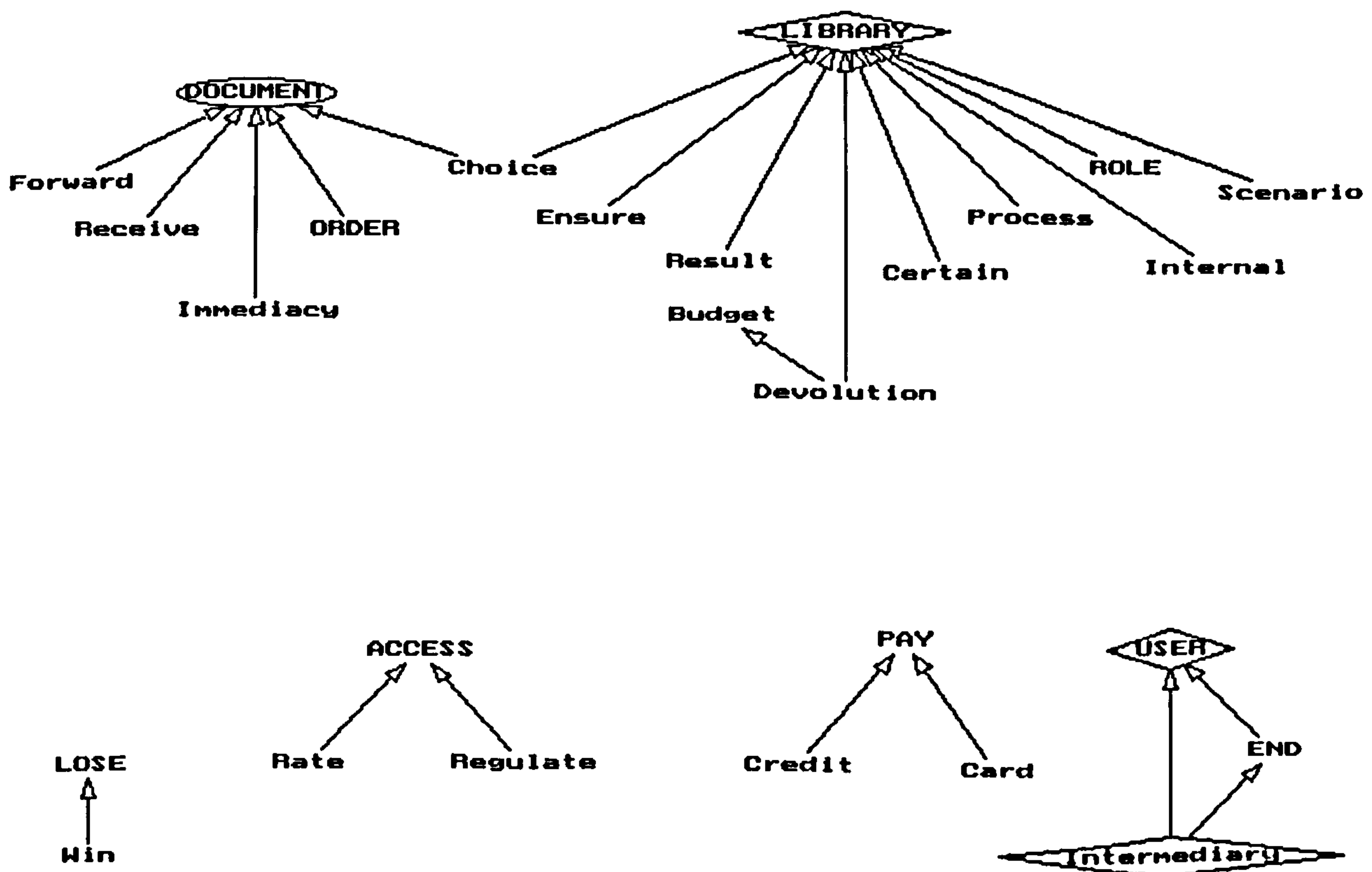
In Figure 123 we can see the cluster based on 'Library' that is familiar from Figures 101 and 112. However, it is again smaller than in these previous diagrams, suggesting that 'Library' is not such a central word for the interviewees from BLDSC. It appears to be defined principally in terms of 'User' and 'Document'. Unlike in Figures 101 and 112, the cluster based on Question 5 from the interview schedule remains dissociated from the 'Library' cluster at this threshold level, suggesting that Question 5 formed a distinct area of discourse for the BLDSC interviewees. Interestingly, 'Publisher', which should

perhaps be a part of the Question 5 cluster is instead a part of a greatly expanded 'Copyright' cluster, which is therefore a major focus of information chain words. The centrality of 'Copyright' in Figure 123 when compared with Figures 101 and 112 suggests that BLDSC interviewees saw this as a key constituent of the information chain, whereas librarians tended to base their construction of the information chain on the wording of Question 5 from the interview schedule. As in equivalent previous diagrams, the only technology words are 'Electronic' and the somewhat ambiguous 'System', and scholarly communication words are limited to 'Document', 'Journal' and 'Text'.

For an alternative view of the actor-networks in play in the interviews with managers at BLDSC, an inclusion diagram was constructed and is shown in Figure 124.

Figure 124: The global inclusion network diagram from the BLDSC interview corpus

(threshold I = 0.75)



The prominence of 'Library' as a word that includes many less frequent words is common to Figure 124 and equivalent diagrams for the librarian corpus (Figure 113) and the interviews as a whole (Figure 102). In common with Figure 113, many of these words are ambiguous so that it is difficult to characterise the 'Library' actor-network for the BLDSC interviewees. There are certainly similarities between it and that for librarians. However, unlike the diagram for librarians, the relative importance of 'Document' is also apparent in Figure 124. Although more prominent in the BLDSC association diagrams than it was in those for librarians, 'Copyright' does not appear to occupy a high position in terms of inclusion; it may be better to think of it as a key linking term rather than as a centre of translation. The position of the 'Copyright' cluster, as well as those of 'Library', 'Document' and Question 5, were explored further using the leximappe procedure.

Leximappes

A series of leximappes were produced for the BLDSC corpus, as described in Chapter Three, and these offered a way of focusing attention on how semantic clusters were related to each other.

Figure 125: BLDSC interview corpus - Leximappe A

Seed pair {Credit-Card} S = 1.00

Minimum S for internal links = 0.15 Minimum S for external links = 0.10

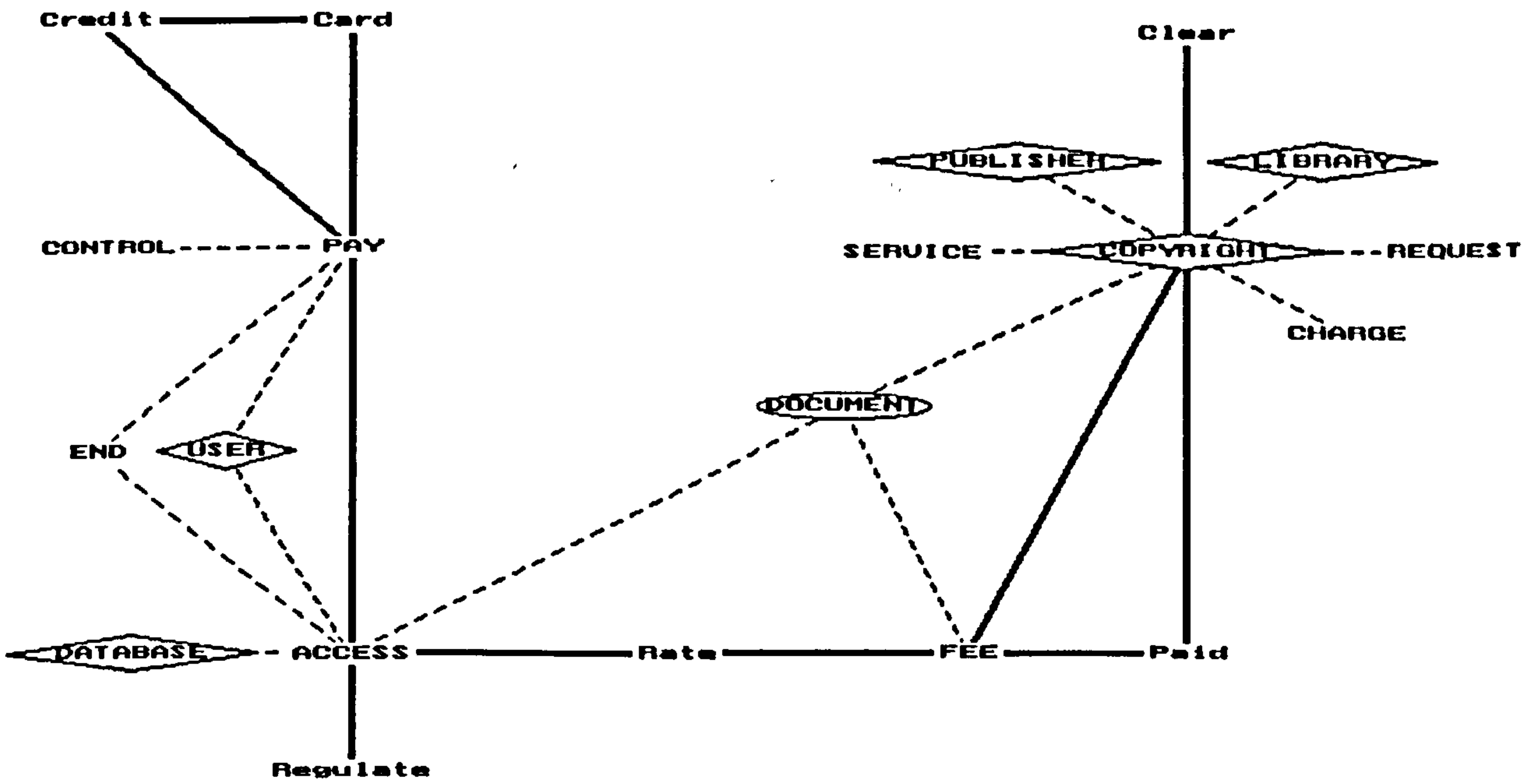


Figure 126: BLDSC interview corpus - Leximappe B

Seed pair {Full-Text} S = 0.69

Minimum S for internal links = 0.078 Minimum S for external links = 0.10

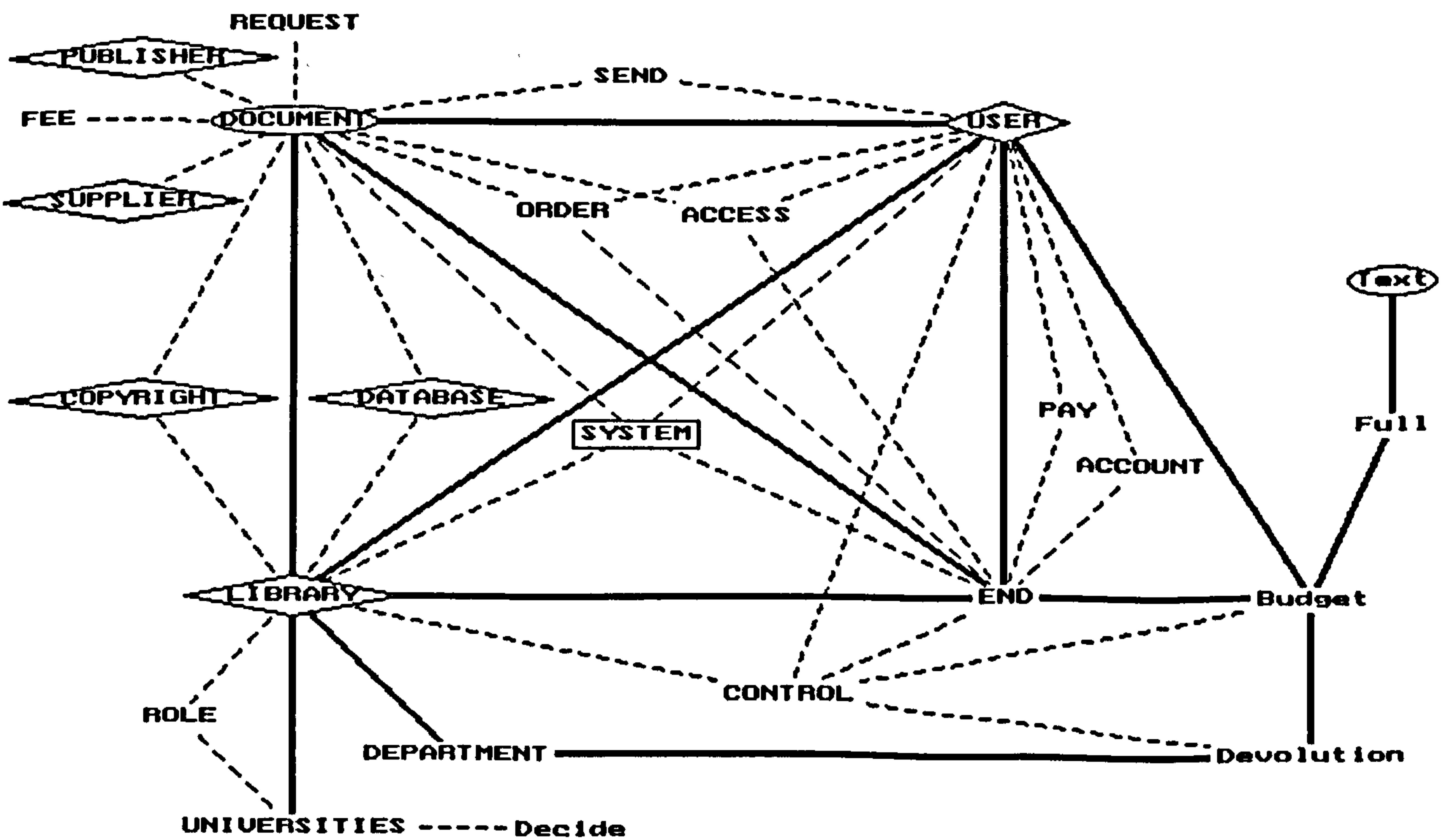


Figure 127: BLDSC interview corpus - Leximappe C

Seed pair {Win-Lose} S = 0.43

Minimum S for internal links = 0.13 Minimum S for external links = 0.10

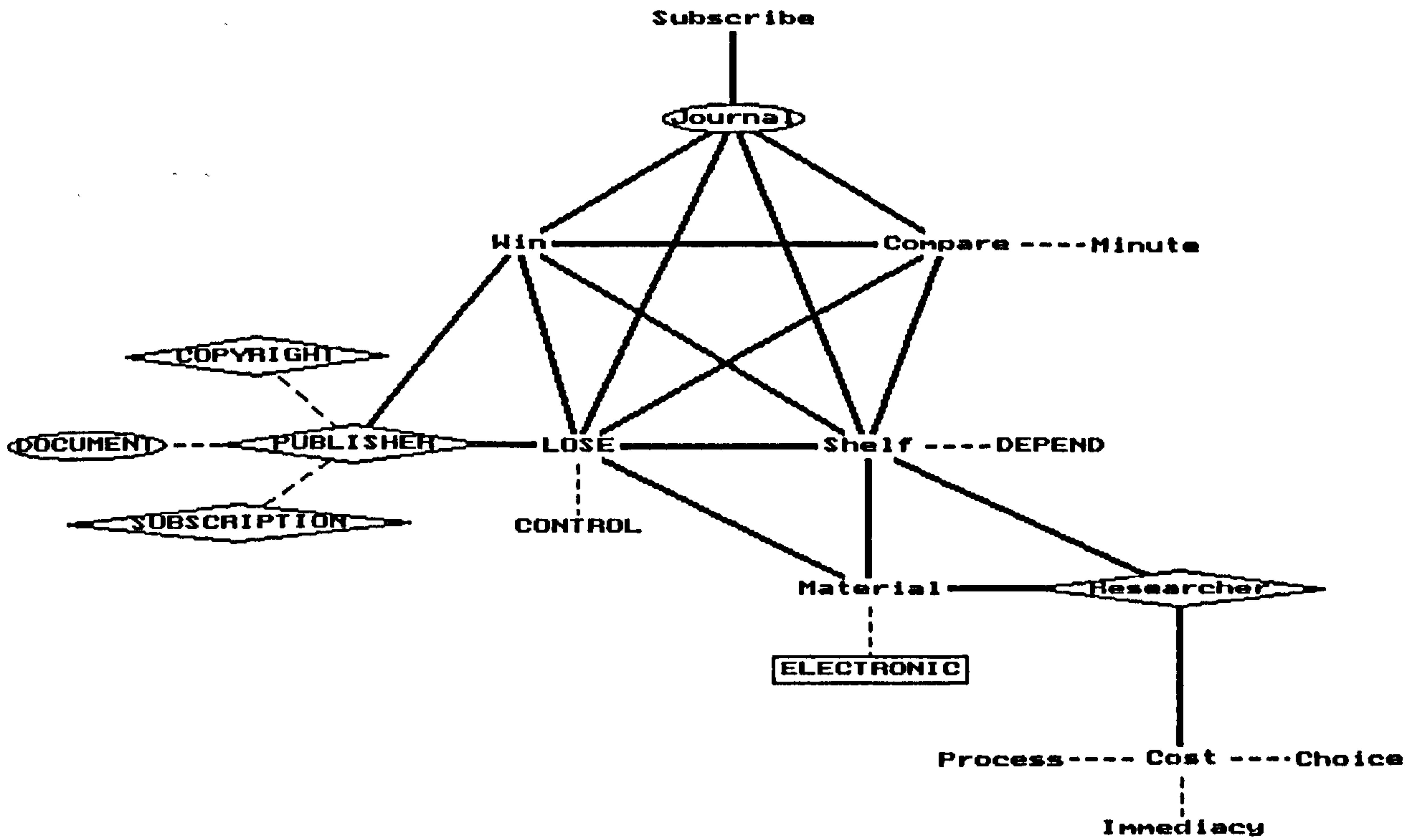


Figure 128: BLDSC interview corpus - Leximappe D

Seed pair {Internal-Forward} S = 0.30

Minimum S for internal links = 0.074 Minimum S for external links = 0.080

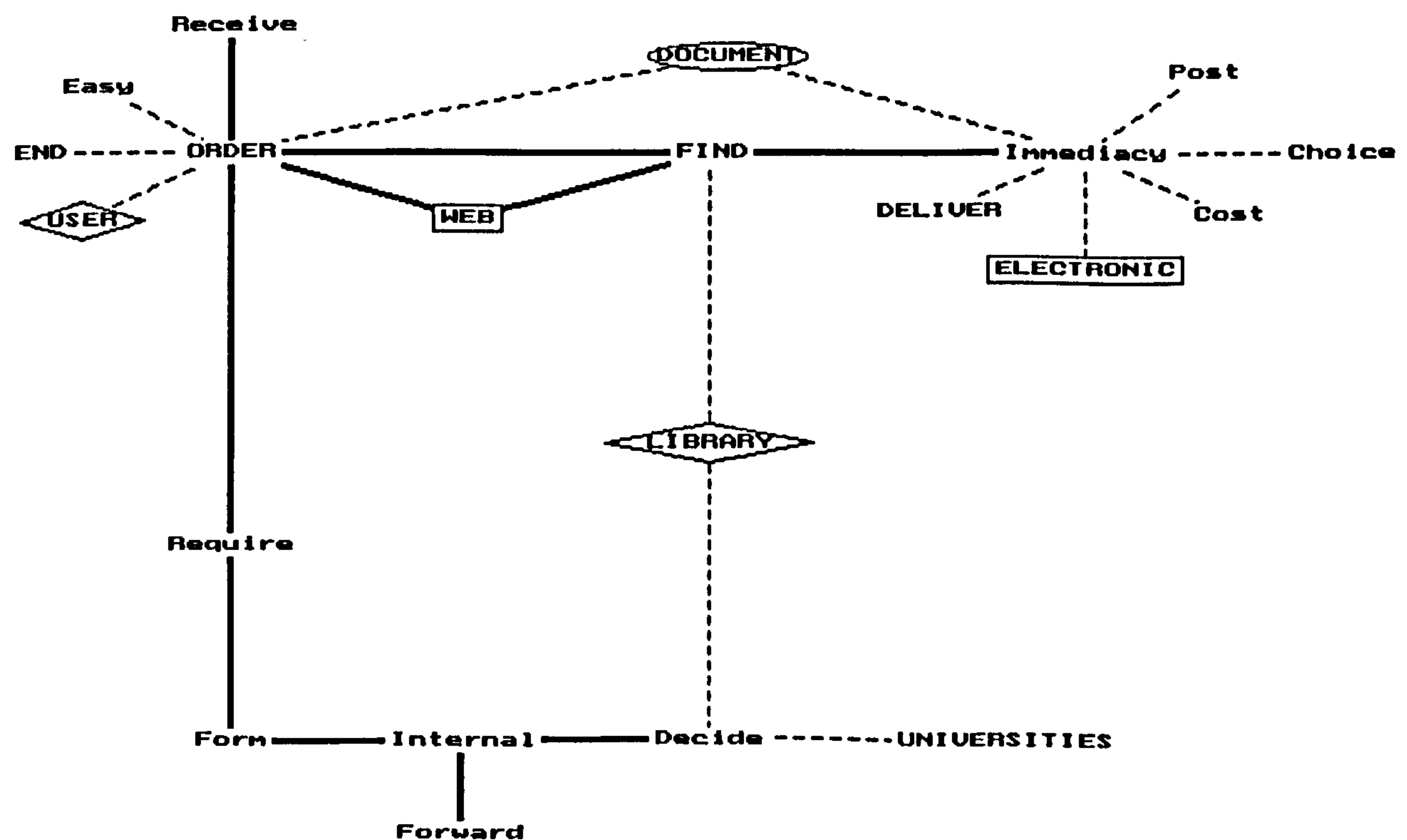


Figure 129: BLDSC interview corpus - Leximappe E

Seed pair {Send-Request} S = 0.25

Minimum S for internal links = 0.094 Minimum S for external links = 0.090

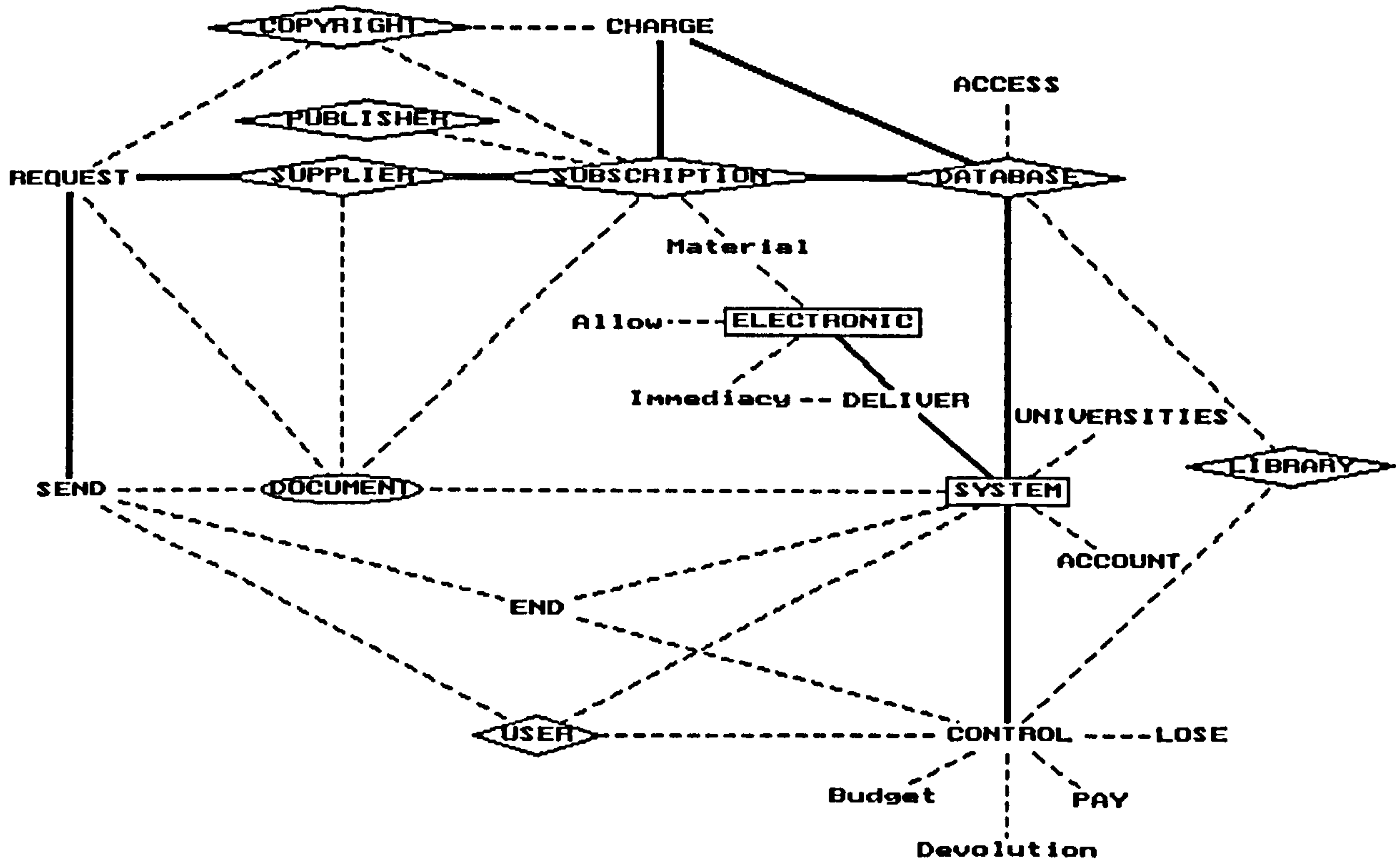


Figure 130: BLDSC interview corpus - Leximappe F

Seed pair {Choice-Process} S = 0.13

Minimum S for internal links = 0.069 Minimum S for external links = 0.070

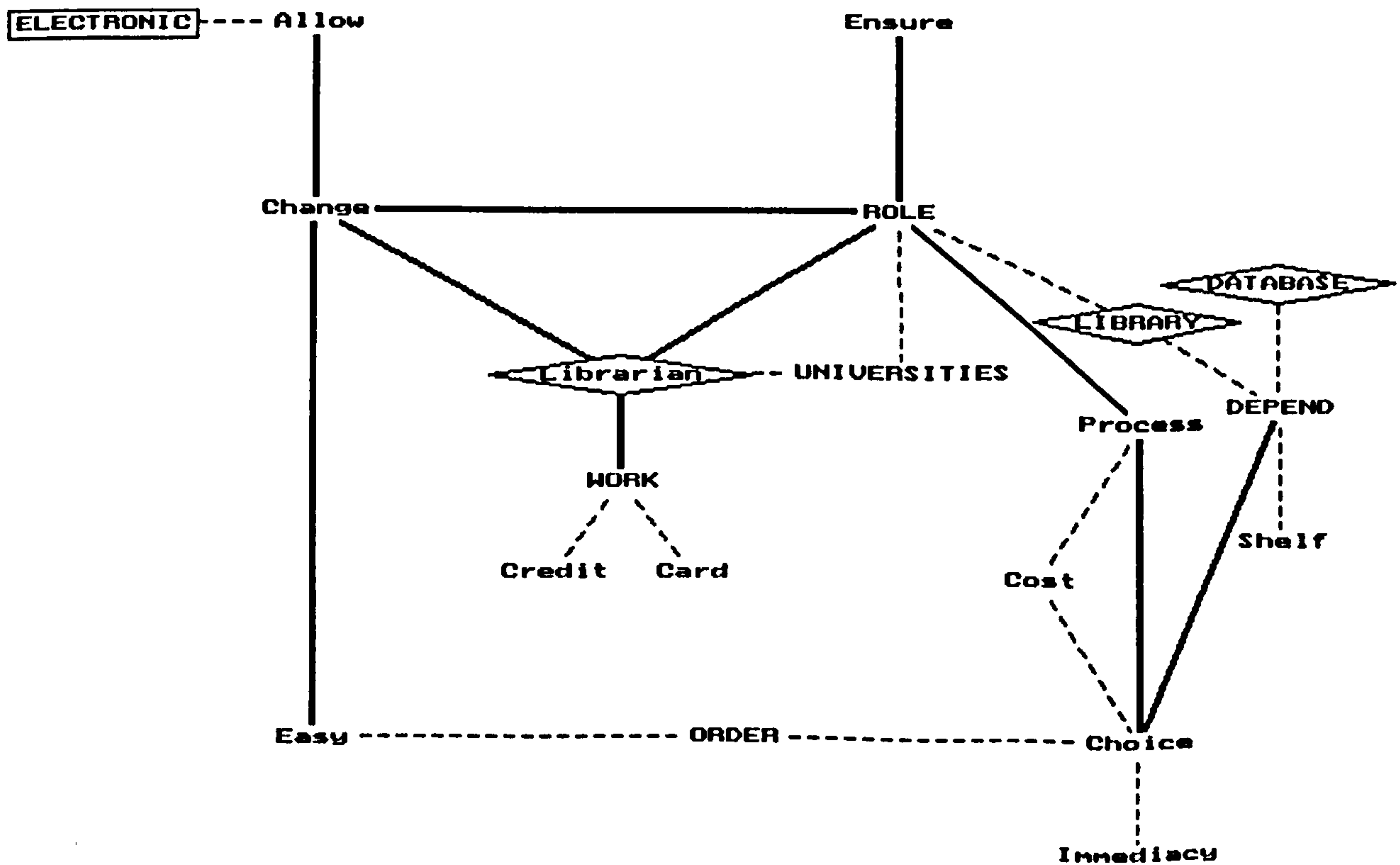
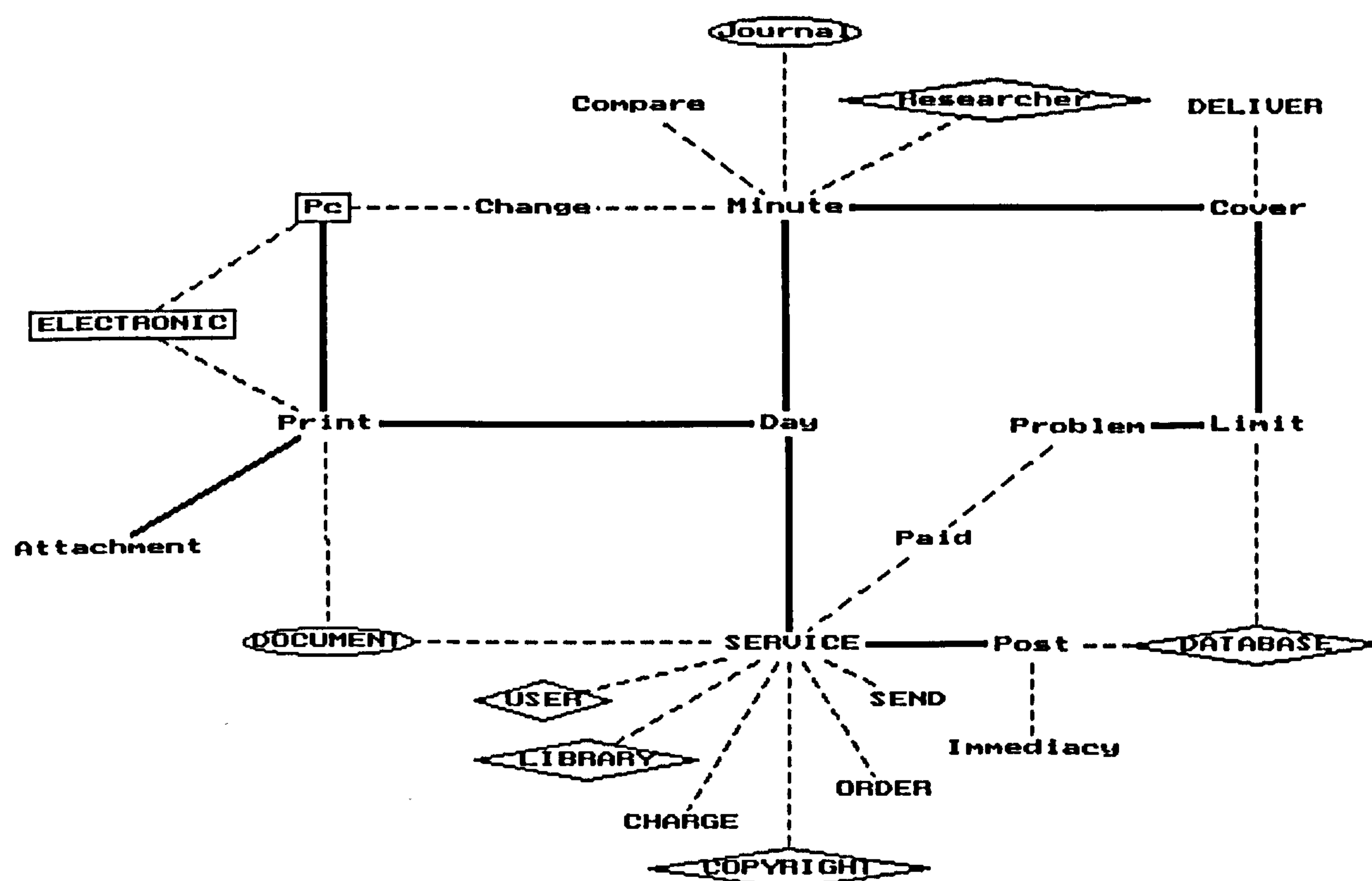


Figure 131: BLDSC interview corpus - Leximappe G

Seed pair {Post-Service} S = 0.13

Minimum S for internal links = 0.067 Minimum S for external links = 0.060



This series of leximappes, representing the interviews with those working at BLDSC, reflects the structure of the global network diagrams (Figures 122-124). In particular, Leximappe A (Figure 125) corresponds broadly to the cluster centred on 'Copyright' in Figure 123, Leximappe B (Figure 126) corresponds broadly to the cluster centred in 'Library', and Leximappe C (Figure 127) corresponds broadly to the cluster that represents Question 5 from the interview schedule. The remaining leximappes are mainly below the threshold of Figure 123.

Comparing this leximappe series with that representing the interviews with academic librarians, it appears that BLDSC Leximappe A does not have an equivalent among the librarian leximappes. This reinforces the claim made above that issues relating to copyright were more central to the discourse of interviewees from BLDSC than those from academic libraries. These issues, from Leximappe A, appear to be mainly financial. BLDSC Leximappe B (Figure 126) corresponds to Leximappe A from the librarian corpus (Figure 114), starting from {Full-Text} and including {Library-User}. However,

BLDSC Leximappe B excludes the dyads {Regulate-Access} and {Expect-Pay} that are a part of Figure 114 and that can be traced to the interview schedule. The former is included in BLDSC Leximappe A, whereas the latter does not appear in the BLDSC leximappes at all. In their place in Figure 126 is {Budget-Devolution-Department}, suggesting that devolved campus budgets were a relatively major concern of those interviewees from BLDSC. Figures 115 and 127 show the Question 5 cluster in the librarian and BLDSC corpus respectively, with the latter perhaps being more internally linked. From this point on the two leximappe series are very different to each other, it being impossible to relate Leximappes D-G from the BLDSC corpus with any from the librarian corpus.

Considering the information chain words, the prominence of 'Copyright' and 'Library' have already been noted. Only 'Publisher' and 'Researcher' appear in Leximappe C, representing Question 5 and thus the construction of the information chain in the interview schedule. The more substantial cluster of information chain words is in Leximappe E (Figure 129), which includes {Supplier-Subscription-Database}. Leximappe F is highly suggestive, linking as it does 'Librarian' with both {Ensure-Role} and {Electronic-Allow-Change}. This hints at the dilemma facing the information chain profession of librarianship at a time of great technological change. The pattern of technological words in the BLDSC leximappes appears different to that in the librarian leximappes, although this is not wholly clear. In order to clarify this pattern and show any relationship between the categories of technology, scholarly communication and the information chain, a synthesis diagram was generated from the leximappes using the principles described in the methodology section.

Synthesis

Figure 132: BLDSC interview corpus - Synthesis diagram

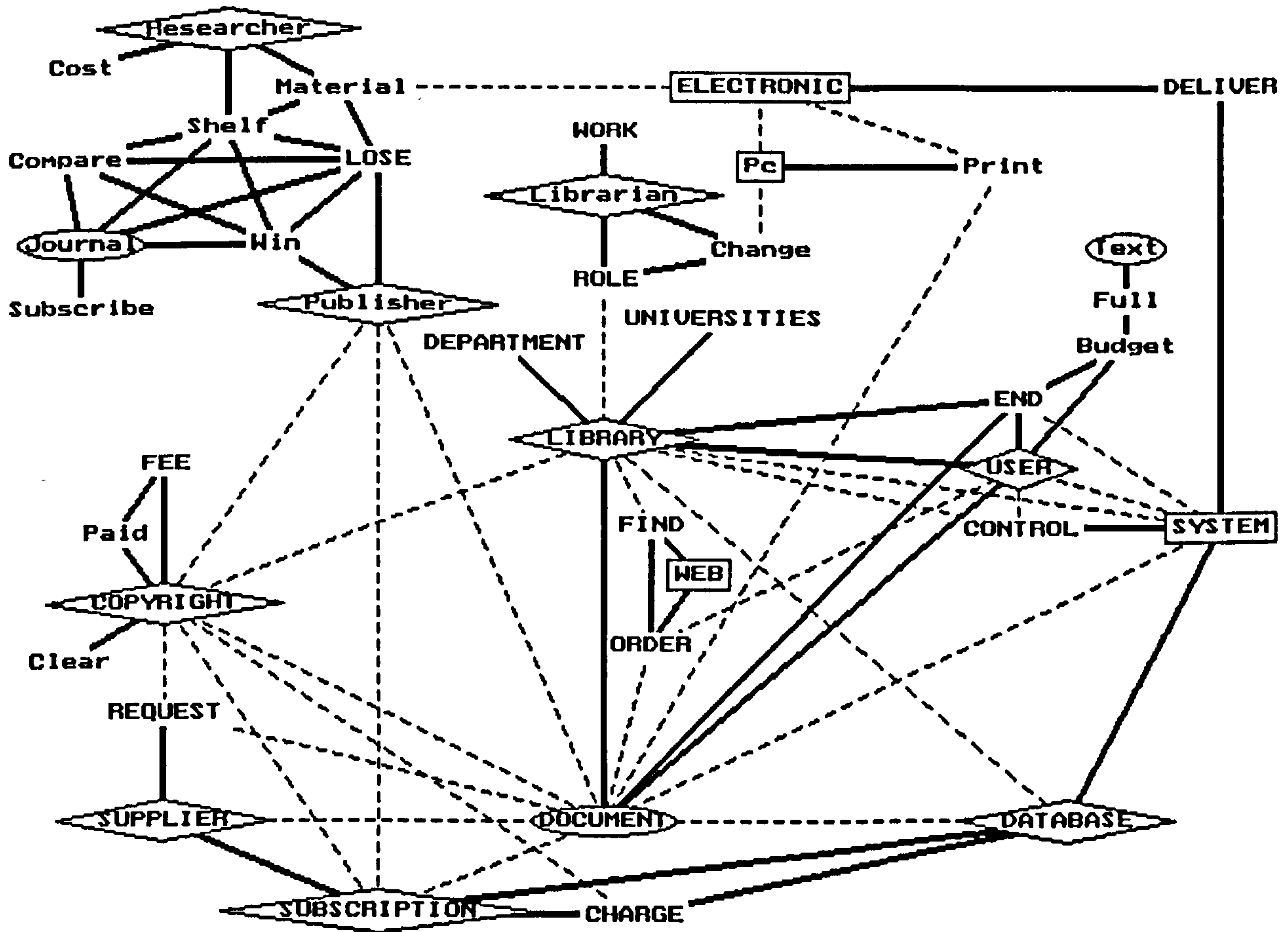


Figure 132 confirms that ‘Library’ is a central word, and that ‘Copyright’ is also important. However, the networks associated with each are not linked closely. Instead, ‘Library’ is principally defined in terms of ‘System’ via {End-User} and ‘Control’. There are other important links with ‘Library’, including via ‘Document’ (both directly and via {Find-Order-Web}) and via {Librarian-Role} through ‘Change’ to {PC-Electronic}. These are the boundary regions between technology and information chain words, and they are concentrated in terms of the latter on ‘Library’ and ‘Librarian’.

‘Copyright’ is a part of less extensive networks, but is involved in what might be described as the main information chain region to the left and bottom of the diagram, which would include ‘Publisher’, ‘Subscription’, ‘Copyright’, ‘Supplier’ and ‘Database’.

The only link between these two categories that does not involve libraries is {Database-System}.

In terms of the boundary region between the categories of scholarly communication and the information chain, the most obvious link is {Library-Document}. 'Journal' is linked via {Win-Lose} to 'Publisher', but this is almost certainly an artefact of the interview schedule. There are no clear links between the categories of scholarly communication and technology.

Comparing Figure 121, the equivalent diagram for the interviews with librarians, with Figure 132, it is apparent again that 'Copyright' is absent in the former but prominent in the latter as a part of a region rich in information chain words. This region might therefore be the basis for a definition of the information chain that was in play in the interviews with people working at BLDSC but not in the interviews with academic librarians. In contrast, the academic librarians supplemented the construction of the information chain in Question 5 of the interview schedule with {ILL-Library-User}. Again, comparing Figures 121 and 132, and Figure 110 representing the whole information professional interview corpus, we can see that Figure 132 is distinctive in the relationship between 'Electronic' and 'Library', which is not cast in terms of temporal issues as in Figures 110 and 121, but in terms of technology and the library role. It appears that those working at BLDSC were far more explicit about this issue than were academic librarians themselves.

The final group of interviewees to be analysed were those who worked in commercial companies, and it is to those interviews that we now turn.

Interviews with those working in commercial companies

This section is concerned with the corpus that is defined as those interviews that were with people working in commercial companies, which amounted to nine interviews.

Because this was only around 27% of the corpus as a whole, it was expected that there could be major differences between the findings relating to this corpus and those relating to the corpus as a whole. Furthermore, it is arguable whether a commercial context was sufficient justification for grouping these interviewees, who included publishers, database aggregators and document suppliers, together. However, it was decided that this grouping was sufficiently distinct from academic librarians and BLDSC managers so as to support comparison between them. The results are given in the following order:

- Graphical estimation of the core words used most frequently;
- Global network showing the overall distribution of the words in the interviews according to the S (association) and the I (inclusion) indexes;
- Leximappes for the interviews with those working in commercial companies;
- Synthesis of leximappes to show ‘information chain’, ‘scholarly communication’ and ‘technology’ networks in relation to each other.

Graphical estimation of the core

A core of words for the commercial corpus was estimated from the Bradford-like distribution of the prompt words (see Chapter Three). The non-linear section of the graph includes all words ranking above Log 3.5, which gives a core of words as follows:

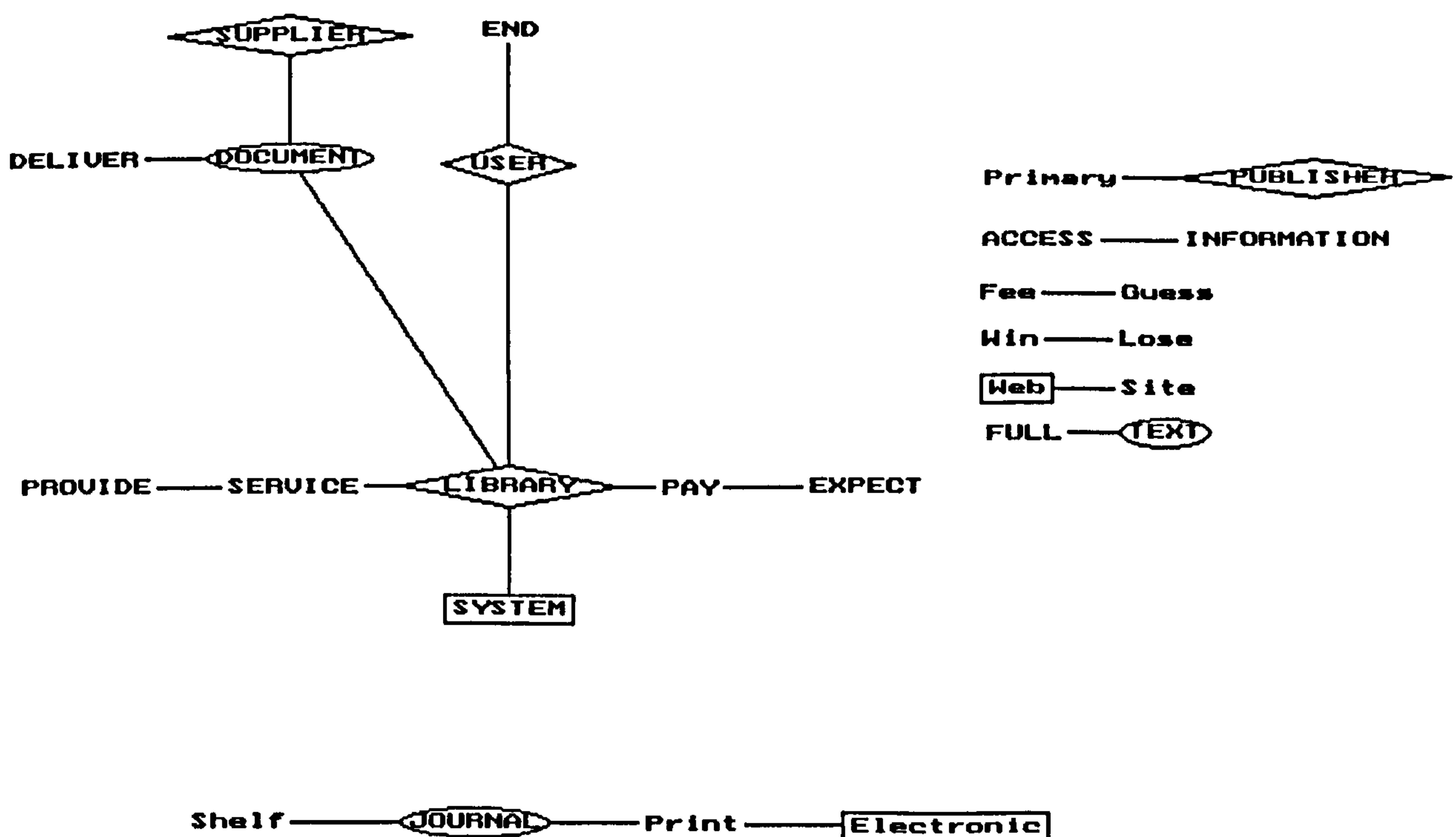
LIBRARY, DOCUMENT, SYSTEM, USER, ACCESS, SERVICE, PAY, DELIVER, JOURNAL, DATABASE, PEOPLE, LIBRARIAN, NEED, SUBSCRIPTION, PROVIDE, PUBLISHER, SUPPLIER, UNIVERSITIES, TIME, USE, BUDGET, INFORMATION, LOOK, ORDER, COST, EXPECT, BASE, END, INDIVIDUAL, FULL, ABILITY, ARTICLE, TEXT.

Global network diagrams

The global association network diagram for the commercial interview corpus is shown at two threshold values of the association index in Figures 38 and 39.

Figure 133: The global association network diagram from the commercial interview corpus (1)

(threshold $S = 0.14$)

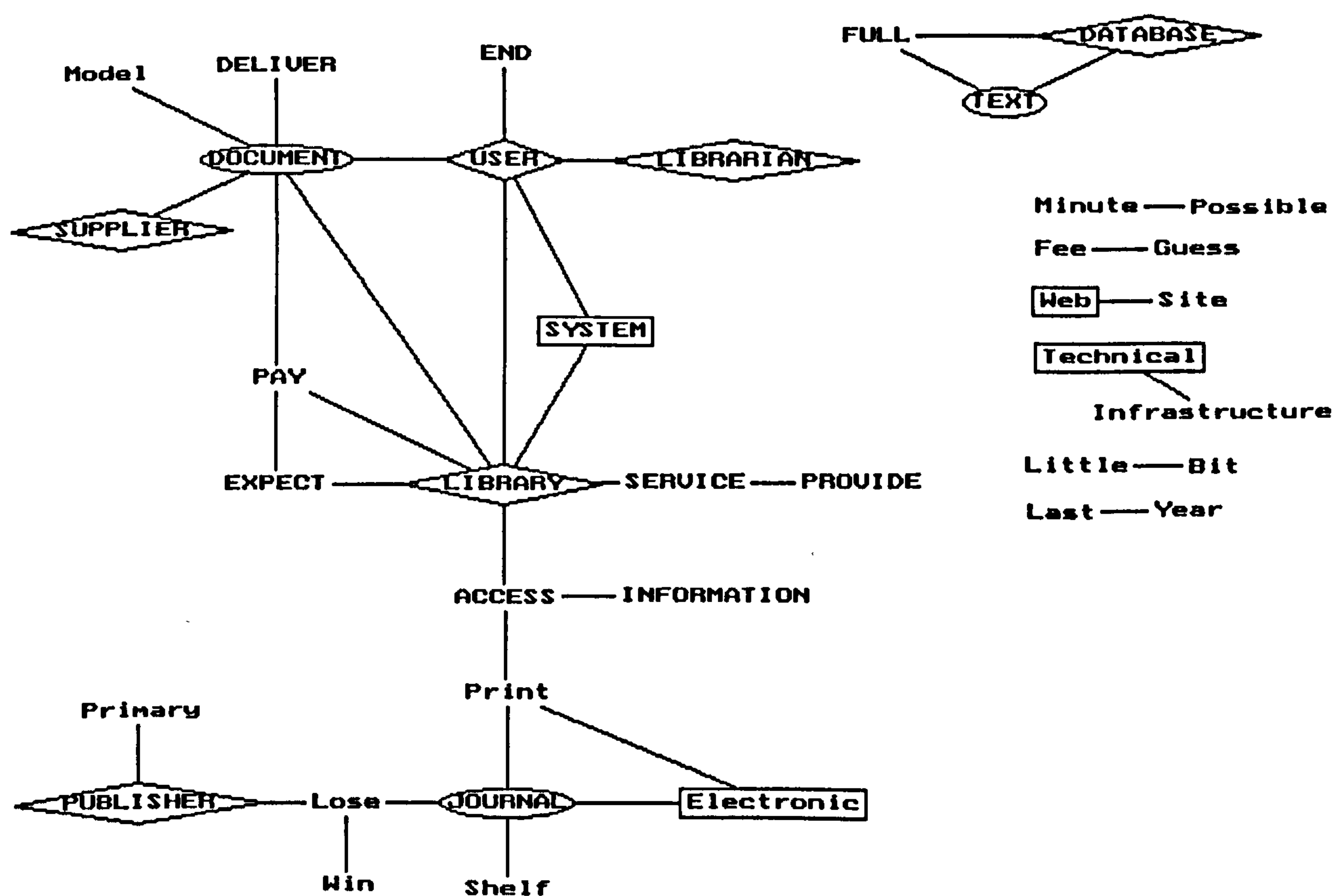


At this high threshold value of the association index it appears that the association network representing the commercial interview corpus contains many similarities with that representing the interview corpus as a whole (Figure 100). It would appear that, at this threshold level, the interviews with those working in commercial companies were more typical than the interviews with either librarians or people working at the BLDS. The two major differences between Figure 133 and Figure 100 are, firstly, that there are many more dissociated dyads in Figure 133 than Figure 100 and, secondly, that two of these dyads, {Win-Lose} and {Primary-Publisher} contribute to the secondary network in Figure 100. This secondary network in Figure 133 {Shelf-Journal-Print-Electronic} does

not, therefore, represent Question 5 from the interview schedule as clearly as it did in Figure 100. Compared with the equivalent diagrams for both the librarian (Figure 111) and the BLDSC (Figure 122) corpus, it would appear that the 'Library' cluster is more prominent and the Question 5 cluster less prominent in Figure 133. If we increase the detail by decreasing the threshold value, we get Figure 134. Again, in Figure 134 I have tried to maintain some of the layout of Figure 133, and of Figures 101, 112 and 123 so that comparisons can be drawn with the interview corpus as a whole and with the librarian and BLDSC corpora.

Figure 134: The global association network diagram from the commercial interview corpus (2)

(threshold $S = 0.11$)



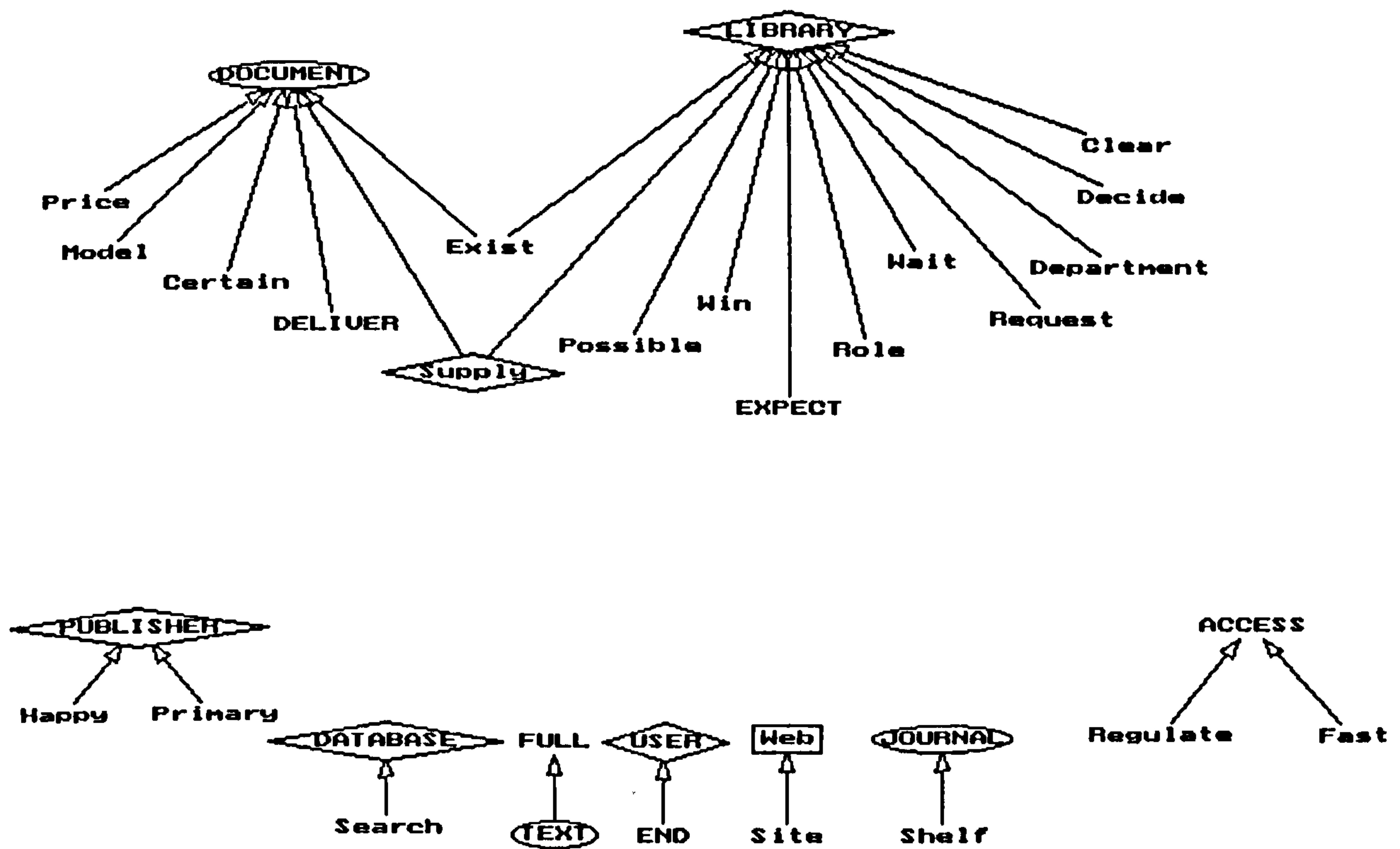
In Figure 134 we can again see the cluster based on 'Library' that is familiar from Figures 101, 112 and 123, representing respectively the whole information professional interview corpus, the librarian corpus and the BLDSC corpus. The dissociated dyads

noted above from Figure 133 have now been linked into what was the secondary network, which now represents Question 5 from the interview schedule and is linked to the main network via {Print-Access}. The remaining dyads are from the interview schedule {Technical-Infrastructure}, idiomatic {Little-Bit} or ambiguous at this point {Fee-Guess}. The primary orientation of 'Library' to 'User' and 'Document' that was apparent in the diagram for the BLDSC interviews (Figure 123) is also clear in Figure 134 although, unlike previous equivalent diagrams, it is linked with {Expect-Pay}, which is surely related to Question 1 from the interview schedule. The central position of 'Copyright' from the BLDSC diagram (Figure 124) is completely absent from Figure 134, suggesting that copyright was a major issue only for those working at BLDSC. This may reflect the fact that the operations of the BLDSC were dependent on the 'fair-dealing' exemption in UK copyright law as it stood at the time of the fieldwork, so that the construction of the information chain from the BLDSC perspective was peculiarly oriented toward copyright. However, we might have expected copyright also to be a concern of publishers, commercial document suppliers and so on.

Information chain words are as frequent in Figure 134 as they have been in previous equivalent diagrams, but they are more scattered, perhaps indicating that this category is disaggregated by those working in commercial companies into a series of discrete entities with specific relationships or roles. For example, 'Librarian' is linked with 'User', 'Supplier' with 'Document' and 'Publisher' with 'Primary'. Technology words are perhaps more common in Figure 134 than in Figures 101, 112 and 123. Scholarly communication words are similarly positioned in all four global association diagrams.

For an alternative view of the actor-networks in play in the interviews with those working in commercial organisations, an inclusion diagram was constructed and is shown in Figure 135.

Figure 135: The global inclusion network diagram from the commercial interview corpus
 (threshold I = 0.65)



In common with the inclusion diagram representing the BLDSC interview corpus (Figure 124), the central position of ‘Library’ is supplemented in Figure 135 by that of ‘Document’. Again, there is little overlap between these two actor-networks, which were explored further using the leximappe procedure.

Leximappes

A series of leximappes were produced for each corpus, as described in the methodology section above, and these offered a way of focusing attention on how semantic clusters were related to each other.

Figure 136: Commercial interview corpus - Leximappe A

Seed pair {Full-Text} S = 0.83

Minimum S for internal links = 0.090 Minimum S for external links = 0.080

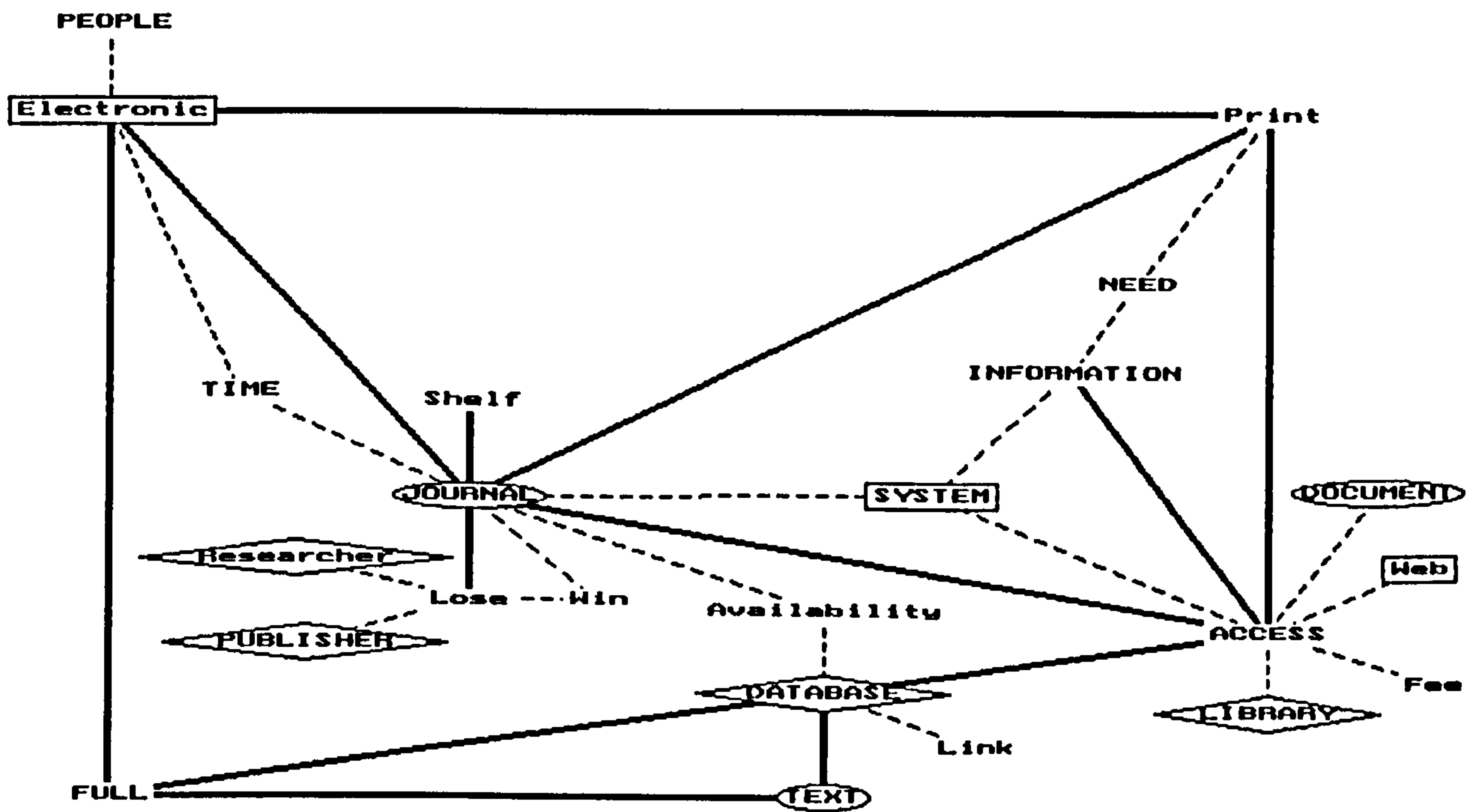


Figure 137: Commercial interview corpus - Leximappe B

Seed pair {Document-Deliver} S = 0.46

Minimum S for internal links = 0.15 Minimum S for external links = 0.10

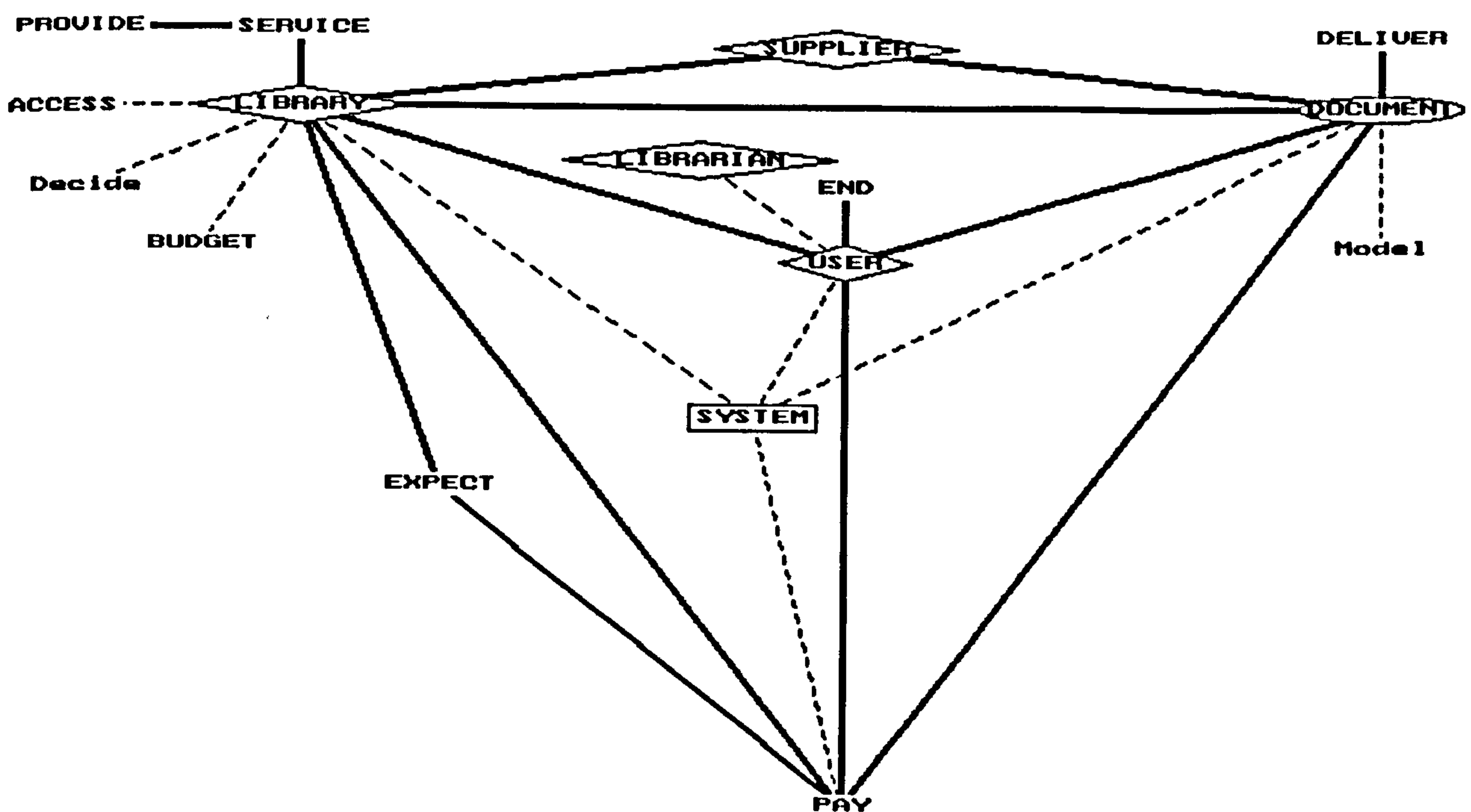


Figure 138: Commercial interview corpus - Leximappe C

Seed pair {Primary-Publisher} S = 0.17

Minimum S for internal links = 0.072 Minimum S for external links = 0.060

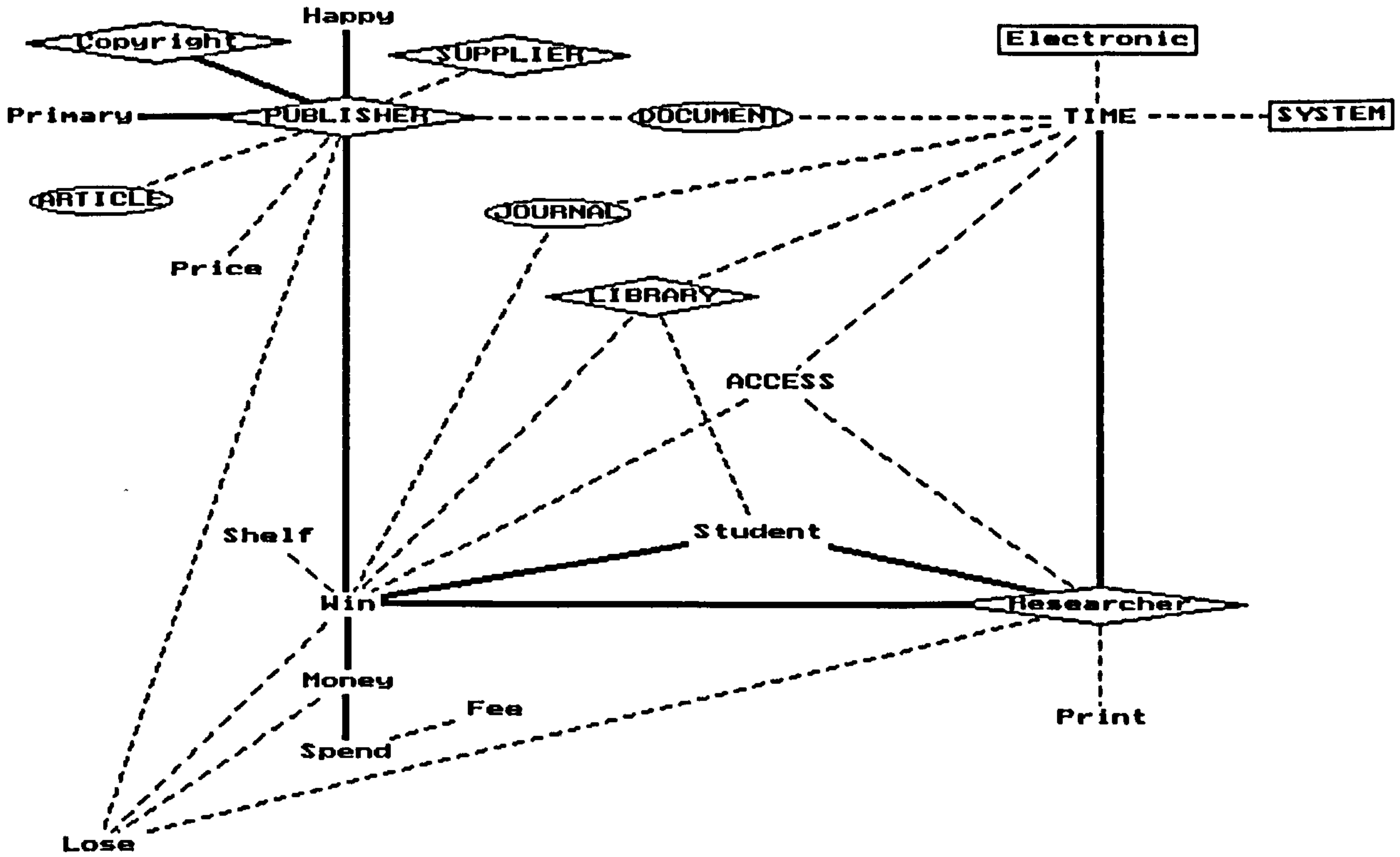


Figure 139: Commercial interview corpus - Leximappe D

Seed pair {Web-Site} S = 0.16

Minimum S for internal links = 0.049 Minimum S for external links = 0.060

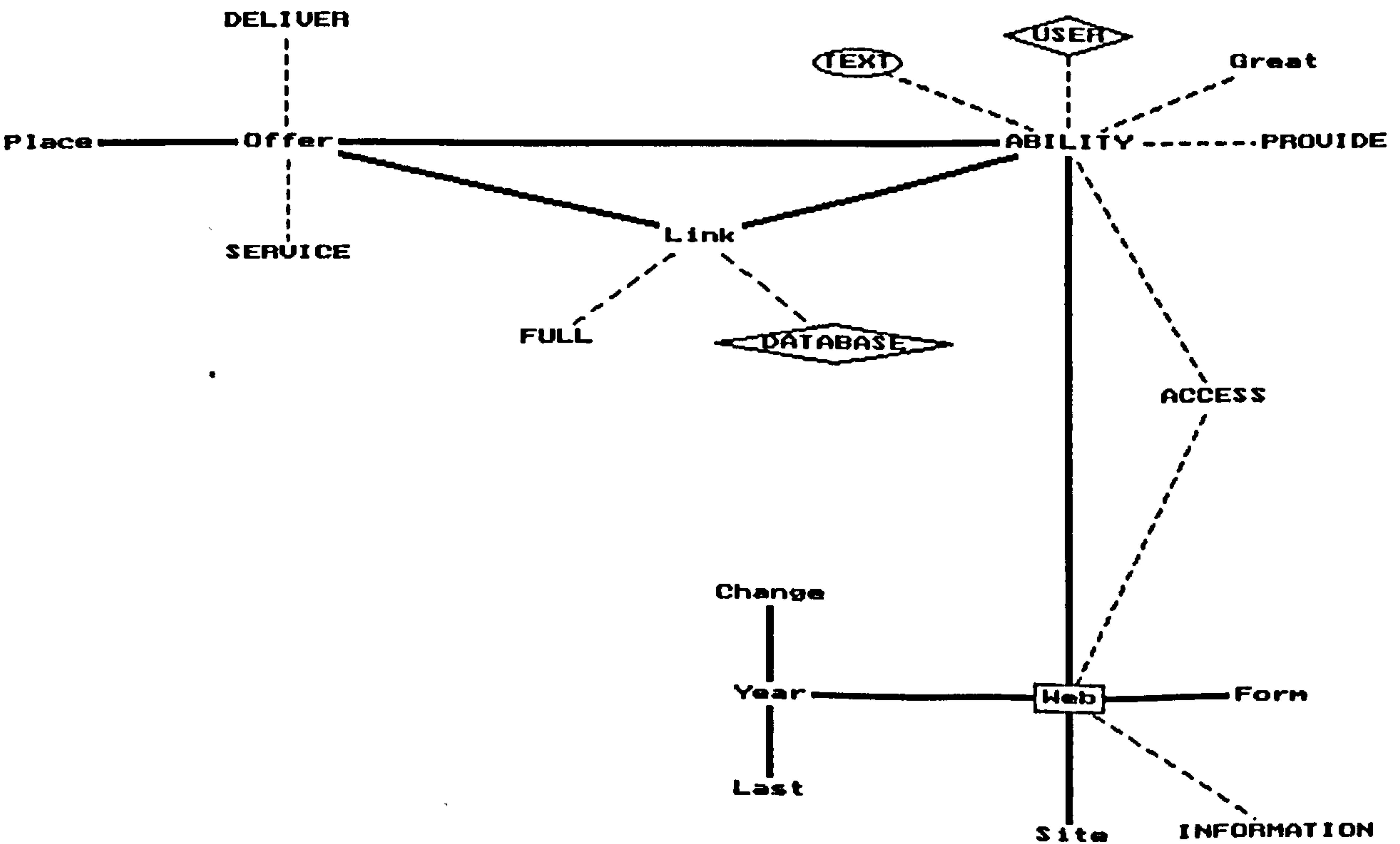


Figure 140: Commercial interview corpus - Leximappe E

Seed pair {Guess-Fee} S = 0.15

Minimum S for internal links = 0.057 Minimum S for external links = 0.060

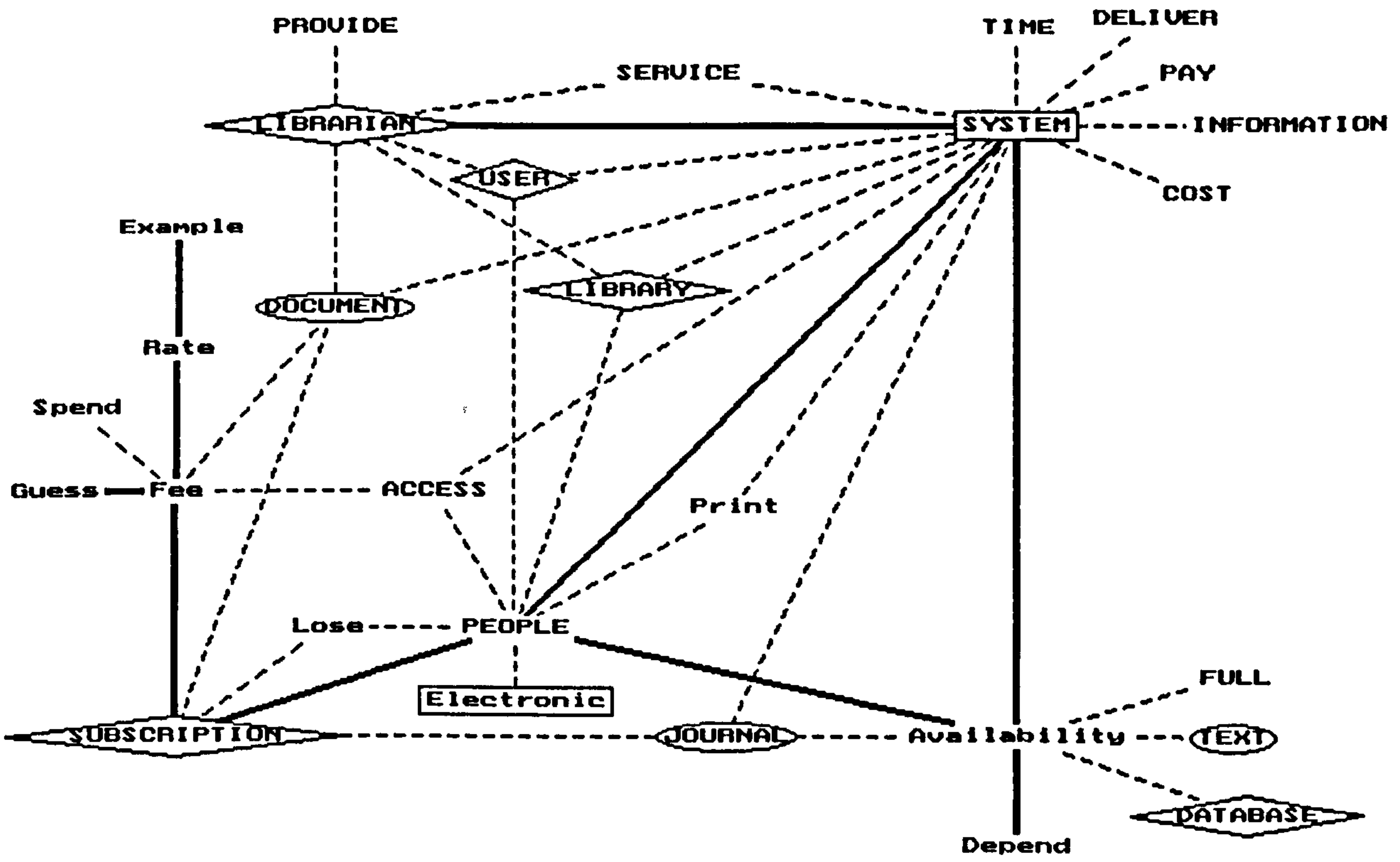


Figure 141: Commercial interview corpus - Leximappe F

Seed pair {Technical-Infrastructure} S = 0.13

Minimum S for internal links = 0.067 Minimum S for external links = 0.055

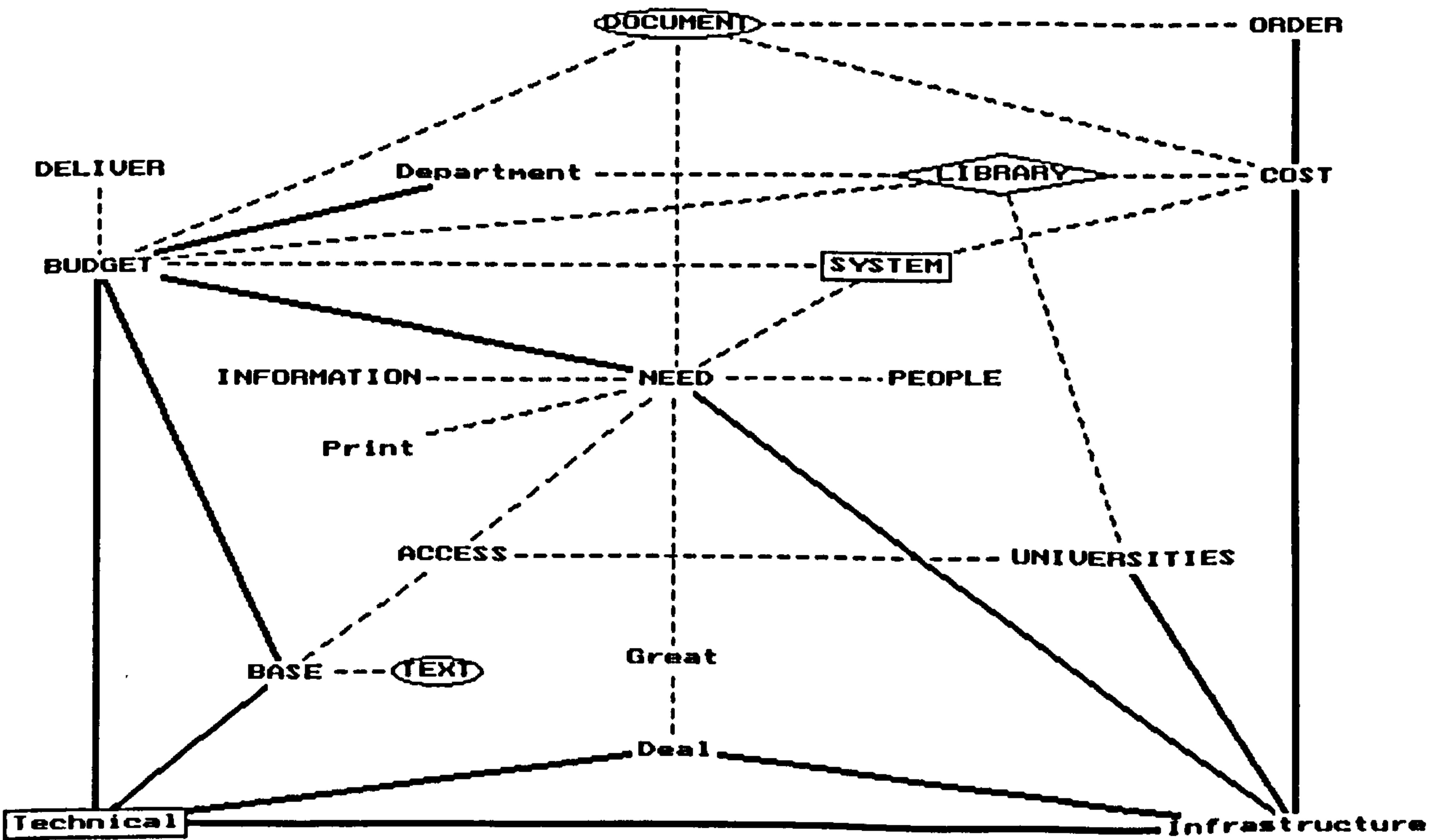
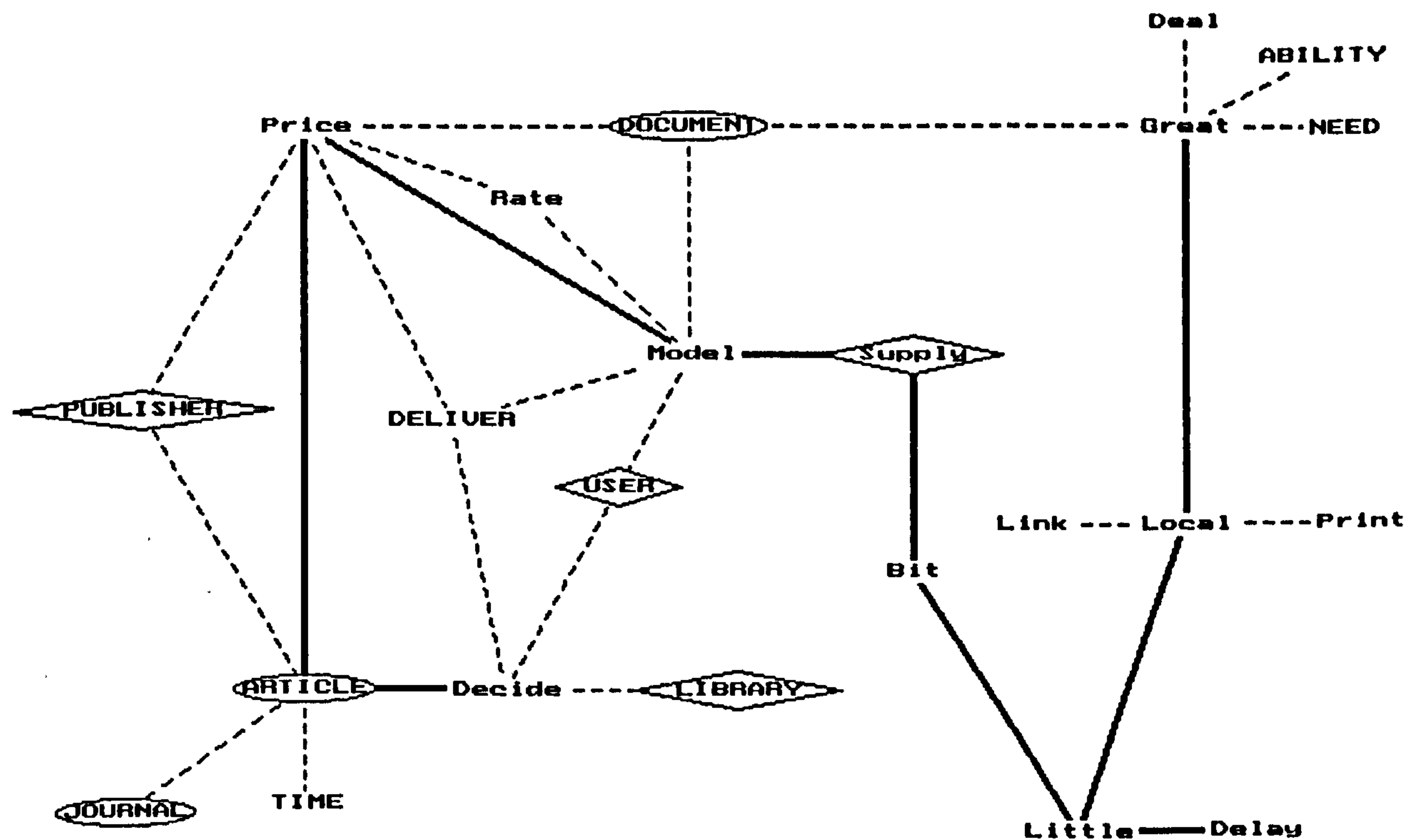


Figure 142: Commercial interview corpus - Leximappe G

Seed pair {Little-Bit} S = 0.13

Minimum S for internal links = 0.056 Minimum S for external links = 0.055



The leximappe series for interviews with people working in commercial companies is, as are previous series, related to the global network diagrams for that corpus, Figures 133-135. Leximappe A includes most of the bottom region of Figure 134 (representing Question 5 from the interview schedule), linking it with the dissociated cluster {Full-Text-Database}, those links being at both 'Access' and 'Electronic'. Leximappe B contains the bulk of the rest of the main network from Figure 134, centred on 'Library' and 'Document'. From Figure 135, we can say that this is the central region of the actor-network of the interviewees' discourse. The remaining leximappes contain fragments from Figure 134 but are mostly below the threshold of that diagram.

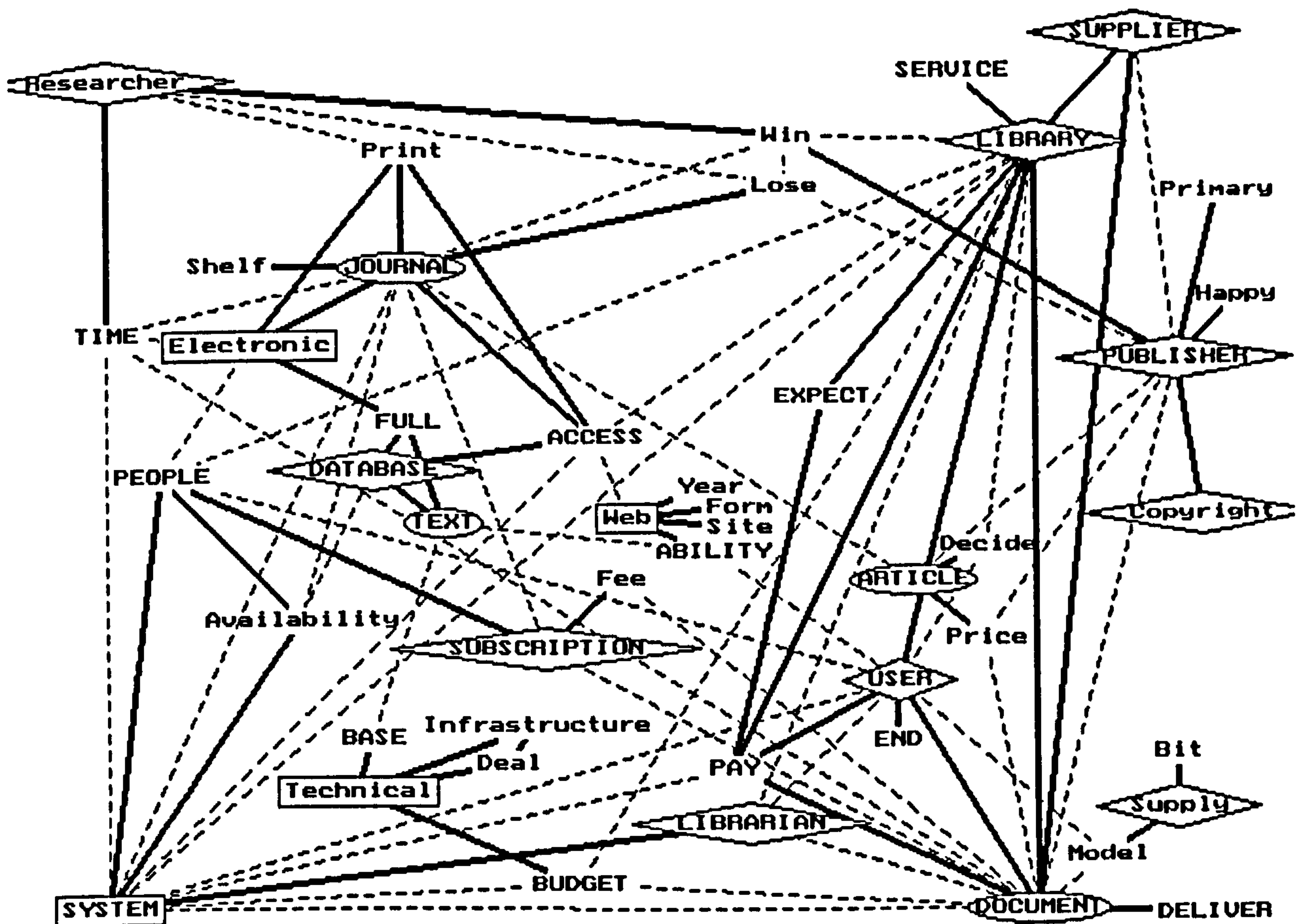
Comparing this leximappe series with those for academic librarians and BLDS, we can see that there is no direct equivalent of Leximappe A (Figure 136), the positions of 'Journal' and 'Access' being different to their positions in the other two leximappe series. Leximappe B is more similar to academic librarian and BLDS leximappes, notably Figures 114 and 126. Leximappe C (Figure 138) relates strongly to Question 5 from the

interview schedule, and includes both 'Time' and 'Money' as parts of answers to it. This compares with the equivalent BLDSC leximappe (Figure 127), which includes 'Control' and 'Cost', and academic librarian leximappe (Figure 115), which includes 'Charge' and 'Pay'. It would appear that the prominence of 'Time' in relation to Question 5 is specific to interviewees from commercial companies. This can be understood by considering that such companies were offering electronic products one of whose advantages was said to be time savings for users. Although largely different to those in previous series, the remaining leximappes (Figures 139-142) do offer some interesting comparisons. For example, the relationship between 'Subscription' and 'System' in Leximappe E is via 'People', 'Journal' and {Access-Fee}, whereas in BLDSC Leximappe E (Figure 129) it is via 'Database', 'Document' and {Material-Electronic-Deliver}. In terms of the relationship between the use of these two words, then, those in commercial companies appeared concerned with finance and people, whereas those in BLDSC appeared concerned with documents and formats. Such differences may be important when assessing how each group of people might approach designing and marketing a subscription-based document access system, as both were considering doing at the time of the fieldwork.

Patterns in the category words, technology, scholarly communication and the information chain, are unclear from the leximappe series, so that a synthesis diagram was generated to bring them together and show how each category was composed and related to the other in the interviews.

Synthesis

Figure 143: Commercial interview corpus - Synthesis diagram



Much of this highly complex diagram can be described as consisting of pathways between 'Library', 'Document' and 'System'. Of course, the first is a member of the information chain category of words, the second a member of the scholarly communication category and the third a member of the technology category, so that these pathways form a complex boundary region between the three categories. 'Library' and 'System' are mutually defined via 'Librarian', {Expect-Pay}, 'Budget', 'Access', 'People' and {Win-Researcher-Time}. Some of these, for example {Win-Researcher-Time} and {Expect-Pay} relate clearly to questions from the interview schedule. 'System' and 'Document' are mutually defined via 'Librarian', 'Budget' and {User-Pay}. 'Document' and 'Library' are mutually defined via 'Librarian', {User-Article-Decide}, {Expect-Pay} and 'Supplier'. Other areas, notably the complex region around

'Electronic', are not best described as between 'Library', 'Document' and 'System' because they are only tenuously linked to these connections via 'People' and 'Access'.

The diagram can, thus, be divided broadly into two, the mutual definitions of 'Library', 'Document' and 'System' and a region around 'Electronic' derived from Leximappe A (Figure 136). That is, the regions approximately below and above the diagonal directly linking 'Library' and 'System'. The former appears to be associated with commercial issues ({Technical-Budget}, {Expect-Pay}, {Article-Price}) whereas the latter appears to contain positive evaluations ('Ability', 'Access', 'Availability'). The information chain, scholarly communication and technology words are split between these two regions. The commercial mutual definitions of 'Library', 'Document' and 'System' include the information chain words 'Librarian' and 'Supply', the scholarly communication word 'Article' and the technology word 'Technical'. The positively evaluative region contains the information chain words 'Researcher', 'Subscription' and 'Database', the scholarly communication word 'Text' and the technology words 'Electronic' and 'Web'. It seems possible to characterise these two regions, then, as:

1. Commercial and administrative, involving the librarian, article purchase and budgets for technical support;
2. Access oriented, involving the end-user, text access and electronic and other systems that do not necessarily involve an intermediary.

If we compare this structure with that found in equivalent previous diagrams (Figures 121 and 132), it is apparent that the {Library-Document-System} complex is present in the interviews with both librarians and those working at BLDSC, but it is not so dominant as in Figure 143. The diagram representing the interviews with BLDSC staff (Figure 132) is perhaps closer to Figure 143 than that representing the interviews with librarians, although 'Copyright' is marginal in Figure 143. In summary, the interviewees working in commercial companies, unlike other interviewees, appeared to characterise the boundaries between the information chain, scholarly communication and technology in terms of either a commercial relationship between libraries, documents and systems or as a matter of end-user electronic access to text.

Summary and concluding remarks

Taking an actor-network view of language use in interviews has allowed for the close analysis of precisely what semantic clusters are important (common) in interviews with information professionals, how these clusters are related to each other, if and where the categories of the academic information chain, formal scholarly communication and machinic technology fit in to these networks and, finally, a comparison of these features between different interview corpora. That is, it has enabled the production of empirically generated experimental fields specific to a number of interview corpora, and the mapping of particular categorical definitions onto those fields. One persistent feature of these fields was the representation in them of questions from the interview schedule. However, sufficient information was available in the co-word matrix, and revealed using the global and leximappe drawing procedures, to enable the different interview corpora to be characterised apart from the representation of the interview questions.

Taking the interviews as a whole, the information chain consisted of a number of mutual definitions of 'Library' and 'Publisher', including that linking copyright and subscriptions with fees and charges, and that linking researchers with the issue of time. Machinic technology was confined to networks linking 'System' with operational matters and 'Electronic' with temporal matters. The centrality of the word 'Library', although arguably a function of the interview schedule, was notable in the whole information professional interview corpus as well as, to a variable extent, in each of the sub-corpora. It was consistently linked with 'User', 'System' and 'Document'.

Within the interview corpus there were major differences in the co-word matrices as depicted in global or leximappe diagrams. For example, those derived from the interviews with academic librarians associated the key technology word 'Electronic' with {Information-Service}, those from the BLDSO corpus associated 'Electronic' with 'Deliver' and those from the commercial corpus associated 'Electronic' with {Journal-Print}. It is clear that each of these groups of interviewees linked a key technological

word from the interviews with words that describe their contribution to the information chain. Again, if we consider the information chain word 'Copyright', this was absent from the diagrams derived from the librarian corpus, was central to those from the BLDSC corpus, and was associated only with 'Publisher' in those from the commercial corpus. This distribution can be argued to parallel the operational perspectives of the three groups of interviews, where copyright is marginal to much of the day-to-day work of academic libraries (although, obviously, central to libraries' mission), is central to the operations of the BLDSC, and is a property right of publishers in the commercial world. Finally, if we consider the scholarly communication words 'Document' and 'Journal', it is clear that 'Document' is more marginal in the diagrams depicting the librarian corpus than those depicting the BLDSC and commercial corpora. Being traditionally concerned with books and journals, it is perhaps unsurprising that librarians found 'Document' a more difficult word to link into their actor-network than did those working in BLDSC and commercial companies. On the other hand, we would expect 'Journal' to be more central for librarians and commercial organisations (including publishers) than for BLDSC, and this is what the diagrams show.

In none of the interview corpora did either of the three categorical definitions, the academic information chain, formal scholarly communication and machinic technology, appear as a discrete cluster. That is, the signals offered by the categorical definitions were scattered by the experimental fields generated from the interview corpora, so that those definitions were unrecognisable. The status of this conclusion with respect to the categories of technology and scholarly communication must be tentative, though, because so few words from those categories were included in the speech of the interviewees. As noted above, those that did consistently appear were revealing in the networks in which they were used by different groups of interviewees.

In terms of boundary regions, the main 'user-library-document-system' region corresponds to recurrent wording in the interview schedule and should probably be considered an artefact of the interview. Otherwise, the paucity of technology and scholarly communication words renders any analysis impressionistic rather than

conclusive. Given the lack of identifiable regions in the synthesis diagrams, one approach is to take a central word from each of the three categories and compare its links across the three interview corpora, as shown in Table 9.

Table 9: Key words and their links in three interview subcorpora
(duplicate links across all three subcorpora are omitted for clarity)

Word	Category	Links in librarian subcorpus	Links in BLDSC subcorpus	Links in commercial subcorpus
Journal	<i>Scholarly communication</i>	electronic, look, library, publisher	compare, subscribe	print, article, access, subscription, availability, system, electronic, time
Publisher	<i>Information chain</i>	journal, supplier	copyright, subscription, document	primary, happy, supplier, copyright, document, article, price
Electronic	<i>Technology</i>	information, journal, look, term, library, availability, moment	material, pc, deliver	journal, full, people

From Table 9, illustrative boundary regions can be proposed for the librarian subcorpus as ‘Electronic-Journal-Look-Library’, for the BLDSC subcorpus as absent, and for the commercial organisation subcorpus as ‘Electronic-Journal-Article’. Of course, these would be different had other words been chosen as representative. Nevertheless, this

approach does suggest that analysable differences in the uses of 'Electronic' and 'Journal' are important in the category boundaries in many of the interviews.

Chapter Eight: Analysis of interviews with information professionals

Introduction

The principles and background of the discourse analysis methodology have been described above. This chapter is concerned, firstly, with a description of the practicalities of the particular analyses undertaken and, secondly, with presenting those analyses.

The topics

The topics of this section, in common with other empirical sections of this study, are formal scholarly communication, the academic information chain and machine technology. These have been provisionally defined in Chapter One. Scholarly communication was understood as involving such things as articles, journals, and processes such as being informed and keeping up to date. The information chain was identified by references to such entities as libraries, document suppliers and publishers. Technology was taken to refer to artefacts (such as computers) and practices (such as email) that were commonly thought of as technological at the time of the fieldwork. In terms of a discourse analytic perspective, these definitions were taken as a reference against which particular data could be assessed in terms of their relevance to the topics. However, the definitions were kept open and I was prepared to react to what I found in the data. I was interested in how these ideas were used by interviewees who were, to a greater or lesser extent, engaged in practices relevant to all three. In particular, how were the three topics used by interviewees to undertake interactional business in the interview, to position themselves and so on? How were the boundaries between the three topics managed, and what else did this management achieve? It is important to note that the analysis was concerned more with what happened during the interviews than with the content of interviewees' responses to questions.

Given that the interviews were with information professionals (librarians, publishers and so on), it was anticipated (and turned out to be the case) that the information chain and technology were much more visible topics than scholarly communication.

The analyses

The three discourse analytic themes described in Chapter Two in relation to the relevant literature were interpretative repertoires, subjectivity and deixis, and interests.

Interpretative repertoires were understood to cover a range of linguistic resources and practices that would only become apparent via analyses of a number of transcripts or excerpts. As a result, no one particular section of analysis was geared to looking at repertoires. Instead, their existence and deployment was considered in terms of the other two analytic foci, subjectivity / deixis and interests. As described in Chapter Two, the former focused on instances of the words 'I', 'we' and 'you'. The latter focused on interest management practices in the interviews, including the enrolment of third party interests. Hence, two sets of analyses are presented, one on subjectivity / deixis and one on interests.

Deixis and subjectivity in the interviews with information professionals

Background

Deixis, or indexicality, is a concept widely used by ethnomethodologists, relating broadly to self-reference. Subjectivity has been employed in post-structuralist writings to denote the positioning or interpellation of individuals so as to staff discursive roles. Potentially, then, these two ideas might be related in particular instances of practice such as the interviews that form the data for this thesis. As suggested in Chapter Two, empirical work on this topic will focus on instances of the words ‘I’, ‘we’ and ‘you’ in the interviews. As noted in Chapter One, I explicitly acknowledge an interest in how the concepts of technology, the information chain and scholarly communication were deployed during the interviews and I suspected there to be lexical registers and repertoires apparent in this deployment, along with boundary management issues between them.

The reader is referred to the interview schedule in Appendix A throughout this section. In all interviews, the interviewer was the author.

Locating the subjective actor

Looking at the interviews, we can see (empirically) that the interviewees deployed two pronoun families denoting personal deixis / subjectivity:

- (iv) first person singular – ‘I’, ‘me’, ‘my’;
- (v) first person plural – ‘we’, ‘us’, ‘our’;

A third pronoun family was used to denote interesting issues of transitivity / subjectivity:

- (vi) second person – ‘you’, ‘your’.

The analyses in this section, then, relate to these three pronoun families. They in no way exhaust the ways in which personal deixis, transitivity and subjectivity were deployed and, furthermore, not all such markers did represent instances of subjectivity – this was an empirical question. However, they are taken here as being an accountable means of defining an important population of speech events in which deixis, transitivity and subjectivity were at stake. That these pronoun families were often important in doing deixis and so on was discovered by reviewing the interview transcripts for prima facie evidence that this was the case.

Examples from the transcripts of each of the pronoun families were:

23. “I wouldn’t want anyone accessing anything on the web, printing off and then incurring charges.”
24. “So really we would not need anything in terms of infrastructure beyond what we currently have.”
25. “You are regulating access to the full text but you don’t want to make it too easy for people because people will see it as being free and they will ask for anything, even if they’re only slightly interested in the article.”

Despite using different words to locate (different kinds of) discursive agency, these excerpts (23-25) relate to a broadly similar kind of subjectivity, that is, the speakers are constructing themselves as particular actors in the information chain. However, each of the three pronoun families could be used in the expression of several different kinds of footing (Goffman 1981). So, for example, the following excerpt uses ‘I’ in two ways (footings), exhibiting contrasting subjectivities:

Excerpt 26 (relating to Scenario 2):

- [1] Interviewee: So I think that there would have to be some sort of self regulation in that sense, in that the staff or students would have to say well, ‘OK, if I want this journal or article I will have to pay for it myself’.

In this example, the first 'I' is indexical to the interview situation. The second 'I' is indexical to one of the hypothetical scenarios set up by the interview schedule, and it expresses a hypothetical subjectivity of library users in that scenario. Clearly, this is an extreme example. Another sentence from the same interview in which 'I' is used twice is as follows:

Excerpt 27 (relating to Scenario 1):

[1] Interviewee: I suppose in terms of access, we have just been discussing usernames and passwords, I would always have to add the new username and password to the current list.

Again, there are two subjectivities being exhibited here; the first 'I' indexes to the interview situation and the second 'I' indexes to a hypothetical scenario from the interview schedule. However, this time the second 'I' expresses the first subjectivity when conditionally 'thrown into' the hypothetical scenario. Note also the use of 'we' in Excerpt 27, indexing directly to the interview situation and used (at least partly) to differentiate this footing from the others present in the sentence.

Similar examples could be given relating to 'we'. What is clear is the potential complexity and richness of personal deixis and subjectivity as analysable data in the interview transcripts. The questions arise, then, as to how such complexity was managed during the interviews (ethnomethodology) and how it and its management are to be managed in this thesis (methodology).

The objectives of the analysis were, firstly, to identify ways in which participants interactively used 'I', 'we' and 'you' during the interviews, secondly to identify the tasks in which participants were engaged in these usages and, thirdly, to identify the other resources used in these interactive tasks. The analysis proceeded by focusing on the uses of the three pronoun families identified above as convenient markers of subjectivity in the text (although, as I have noted, not all such markers did represent instances of subjectivity – this was an empirical question). Appearances of these words in the

interviews were taken to be the population of utterance events that could be analysed. In the 33 interviews described above, the frequencies of the three pronoun families were as shown in Table 10.

Table 10: Frequencies of the subjectivity marker pronoun families in the interviews with information professionals

Word-family	Academic libraries	%	BLDSC	%	Commercial organisations	%	Totals	%
All words	69,677		23,330		32,849		125,856	
First person singular (e.g., 'I')	1,339	38.5	371	38.9	519	40.8	2,229	39.1
First person plural (e.g., 'we')	1,020	29.3	226	23.7	280	22.0	1,526	26.8
Second person (e.g., 'you')	1,118	32.2	357	37.4	473	37.2	1,948	34.2
Totals	3,477	100.0	954	100.0	1,272	100.0	5,703	100.0

In total, these words comprised 4.5% of the total word count (5.0% for academic libraries, 4.1% for BLDSC and 3.9% for commercial organisations). Analysis proceeded by identifying these uses of pronouns. From these large sets, passages of transcript were selected that seemed on first inspection to include a rich and broadly representative array of instances of uses of the pronoun in question. The remainder of this section is, then, divided according to these three pronoun families.

The first person singular – 'I'

Of the three pronoun families, 'I' was the most commonly used in the interviews (Table 10). All instances of 'I' found in the transcripts were indexical to the interview situation in which the speech occurred from which the transcripts were generated. Many were indexical overwhelmingly to that situation alone, and the two instances in Excerpt 28 offer examples of this.

Excerpt 28 (relating to Scenario 1):

- [1] Interviewer: What would the library's preferred way of doing things be?
- [2] Interviewee: I think what works well at the moment is authenticating with IP address.
- [3] And what we have at the moment is an online password page...
- [4] Sorry I've myself mixed up.
- [5] To get onto computers within Nottingham Trent you need to use a Computing Services ID
- [6] Interviewer: So you log onto the network?

Utterance [2] shows a very common use of 'I', one that configures what is to follow as an expression of opinion (Sacks 1992a: 342) given in the interview situation. That situation, though, is a circumstance that both interviewee and interviewer, as competent members of a certain community, recognise as being based on the potential validity of extrapolation from such expressions beyond the confines of the interview. That is, the interview is about something, that thing being the result of ongoing interactions between the interviewee, the interviewer and the interview schedule (which, as was noted above, was available to both participants throughout the interview). 'Doing opinions' is one way to construct what the interview is about, but it involves a commitment on the part of the speaker to adopt what might be called an 'opinion-holding identity', or a subjectivity that can be held accountable for attributable expressions of opinion – 'I' the interviewee. Is it possible to relate this version of what is going on to the data?

Utterance [1] forms a question. That utterance [2] forms at least part of an answer can be seen because 'what works well' is an answer to 'preferred way of doing things'.

However, the question refers to the preferences of the library, whereas the opinion given in [2] is prefaced using 'I'. We might expect the appropriate pronoun for speaking as a spokesperson for the library to be 'we', so that in [2] the interviewee can be heard as shifting the footing to constitute what follows as an opinion for which she can be accountable as an interviewee. This contrasts with her use of 'we' in utterance [3], which refers not to an opinion but to a description of a state of affairs. We can see, then, that in

'doing opinions' in [2], the interviewee specifically chooses 'I' in preference to 'we', which both would be congruent with the question in [1] and is actually used in [3]. However, it is not just in doing opinions that the interviewee has an obligation to be accountable. In utterance [4], she returns to 'I' in order to give an evaluation of her description in [3]. This is an explicit noticing by the interviewee of her obligation to render versions of events, as well as opinions, that are accountable. In utterance [5] the interviewee returns to description work, this time using 'you', a pronoun whose complex uses are discussed in detail below. We can see, then, that 'I' is an important part of opinion work in interviews and that it is used to constitute the speaker as fulfilling her role as interviewee. That this role is accepted by the interviewer is apparent in [6], where he accepts the description offered in [5] and seeks to draw inferences from it.

However, as well as doing opinion work, 'I' can also be understood to be doing category entitlement work. This is not clear in Excerpt 28, other than that the interviewee has constructed herself as an interviewee (an accountable renderer of descriptions and opinions). Excerpt 29 includes explicit category entitlement work using 'I', as well as many other features, some of which I shall address under 'Second person plural', below.

Excerpt 29 (relating to Scenario 1):

- [1] Interviewee: Who would the library expect to pay for access to such a system, or would I expect the end user to pay?
- [2] Interviewer: Yes that sort of issue
- [3] Interviewee: This whole question of who pays for access to information is obviously bound up with political considerations within the universities and institution and the concerns and issues about the autonomy of the library or the information service or DISS in this case.
- [4] There's an inevitable wish on the part of chief librarians to keep control over the budget, so in terms of wanting to retain central control of funds then I think the answer to that is I would expect

payment to be made from a central budget, an information library budget.

[5] Interviewer: Mmm

[6] Interviewee: How would we expect to pay?

[7] Presumably it would be on a pay as you use basis

[8] Interviewer: Or a flat rate subscription is an option

[9] Interviewee: Of course it's administratively easier if the money is coming from a central source to do it on a flat rate subscription, but then there are considerations about accountability back to users, and needing to be transparent in how much use is being made of such systems by various members of the community.

[10] Interviewer: Mmm

[11] Interviewee: Who would regulate access?

[12] I suppose in this model if we were controlling the payment for it then the library would

[13] Interviewer: Mmm

[14] Interviewee: What university infrastructure?

[15] Interviewer: That's a bit of a mouthful

[16] Interviewee: Yes, Well I don't feel qualified to discuss the technical infrastructure.

[17] I would hope that, if such a system was to be easily usable and workable then you certainly need institutional infrastructures in place, but I would hope that here for example we would be able to cope with that sort of thing fairly easily.

[18] Interviewer: That would fit in with what's already around?

[19] Interviewee: Yes, we would be able to do it with our current structures

[20] Interviewer: Mmm

[21] Interviewee: Role of the library I suppose is managing, facilitating and making sure as far as the end user is concerned that there is a very easy route to the documents that he she needs.

[22] So it's facilitating, smoothing but at the same time managing and

controlling to make sure that we are not, that the people are not accessing or printing off more than we can afford for them to have.

[23] Interviewer: Umhm

At this point I shall undertake the analysis of this excerpt by offering a warranted tracing of the first person pronoun through it. In utterance [1], the speaker sets out what will become a theme of this excerpt, the identification of the first person with the organisational entity 'the library'. This identification is achieved through the use of the same predicate ('expect') but with both 'I' and 'the library' as the subjects in a contrastive pair wherein the implied contrast is between who is expected to pay, rather than who is doing the expecting. Hence, a contrast is not implied between 'I' and 'the library', and the speaker has aligned her identity with that of the library. Utterance [3] does descriptive work, characterising the major contextual issue as autonomy, defined financially and in terms of particular actors ('chief librarians') in utterance [4]. These descriptions are strongly intensified ('obviously', 'inevitable') and are used to construct the interest of the library, and hence the speaker, as financial control. This interest is then used to answer the question posed in [1] (acknowledged as such by the interviewer in [5]), which was a reading of a question from the interview schedule. At this point, then, the interests and identity of the library and the first person have been strongly aligned, and this alignment remains available as a resource to be called on later in the excerpt. In addition, in utterance [9] the interviewee responds to a challenge to her assumptions regarding the basis of the question that she has been asked to answer by invoking the library as accountable to users. As we shall see, this causes problems later in the excerpt.

Apart from the interviewee-construction in utterance [12], the next instance of 'I' is at [16]. The category entitlement denial at the start of utterance [16] is interesting in that it allows the speaker safely to display ignorance of the topic. The adjective 'technical' is used in this respect to bracket off those matters for which the speaker is not obliged to account. This enables the first person singular to express no more than 'hope' that matters are in hand, whereas the senior position of the speaker might imply responsibility for such matters. The identification of the organisation and 'I' at the start of the excerpt,

implying the senior position of the speaker, acts as a resource or relevant context at utterance [16]. In response (utterance [18]), the interviewer asks whether utterance [17] implies that matters are indeed in hand. At this point the interviewee changes deictical form to the first person plural and affirms that this is, indeed, the case. The difference between the heavily modalised first person singular expressions ('I hope') and the emphatic first person plural expression of utterance [19] is notable. The difference draws attention to a problem with the interviewee aligning her discursive identity ('I') with that of the library, a problem that explains the initial negative category entitlement in [16]. This problem relates to the tension in the interview between a construction of 'I' as an interviewee who is obliged to render accountable descriptions and opinions, and 'I' as aligned with an institution that, as described in utterance [9], is accountable to users. The negative category entitlement in [16] can be heard as the interviewee opting to retain the indexical 'I' and dropping the use of 'I' as aligned with the library. Indeed, from this point on she uses 'we' as the pronoun for the discursive entity of the library.

Given the tracing of the first person singular through the excerpt, what can be said from this excerpt about the acknowledged prior analytic concern with how the categories of technology, the information chain and scholarly communication were deployed in the interviews? We have already seen above how the interviewee uses the term 'technical' (utterance [16]) to bracket off matters for which she is not accountable. In utterance [21] the speaker is referring to the next question on the interview schedule (see Appendix A), the schedule being available to both interviewer and interviewee throughout the interview. However, the non-linguistic 'continuer' of utterance [20] attends to the structural (or, from utterance [16], 'technical') aspects of the topic mentioned in utterance [19]. If this is borne in mind then the start of utterance [21] can be heard as addressing this attention by describing the library role as concerned with technical or structural issues – as integrating those structures and thus empowering (providing a 'very easy route' for) the end-user. Here, then, technology is being equated with the interests of end-users, and is a positive, empowering force for them. Although far from clear in this excerpt, we shall see that this pattern anticipates those to be found in many excerpts analysed both in terms of deixis / subjectivity and in terms of 'interests'. However, when

in [22] the library ('we') role is addressed, technology is no longer the issue; the speaker returns at this point to the lexicon of 'control' and budgeting with which the excerpt began, especially in utterance [4]. Thus, she avoids the potential problem of the 'automation' repertoire (see the discussion of 'you', below) by shifting away from technology altogether and invoking another discourse, that of finance or commerce.

Invoking the interests of others is a powerful tactic (see 'Interests', below) when working up the legitimacy of an opinion. In utterance [21] the interviewee, having adopted the first person singular as her interviewee identity and 'we' when speaking for the library, invokes the interests of 'end-users'. Note that this is a functional description in terms of the information chain. End-users are so called because they are at the end of the chain. 'End-user' is not a label that emphasises other aspects of the identity of these people, such as their being researchers engaged in scholarly communication. It might be difficult for a librarian to talk of 'controlling' scholars or researchers who work within higher education, whereas as 'end-users' they are within the information chain, for which a library can claim a certain accountability. In another interview, an interviewee constructed himself as a spokesperson for a publisher so that he could legitimately talk of regulating content. In Excerpt 29 the librarian talks of regulating end-users. This can be understood as speakers constructing localities within the information chain where they can claim to be acting for (being accountable for) other entities, enrolling third party interests to support an account.

The deictical shifts in Excerpt 29 can be understood as boundary work, helping to manage the technology repertoires so as to structure the information chain to include the library role. The interests of end-users needed to be configured as such because their legitimacy is based on their scholarly (that is, non-technological and non-commercial) character. Hence, further boundary work is required to discursively construct them as such.

'I' the interviewee and 'I' as spokesperson were, thus, two subject positions available to one of the participants in the interview. Each involved a different accountability, the first

to the interviewer, the second to the organisations for which they spoke. Sometimes these subject positions or accountabilities conflicted, and their management became an analysable feature of the interview.

The first person plural – ‘we’

Instances of the first person plural were defined in the interviews as sentences containing ‘we’, ‘us’ or ‘our’. In this section, I shall use ‘we’ to refer to all of these instances. They occurred significantly less often – see Table 10 – than did instances of the first person singular (‘I’), discussed above. There was some evidence in Table 10 that interviews with librarians included relatively more instance of ‘we’ than did other interviews, which might be explained by the interview schedule being focused on library-based issues. This would suggest that ‘we’ was often used by interviewees to speak as spokespersons.

Although there were several types of uses of ‘we’ in the interviews (for example, sometimes ‘we’, like some instances of ‘I’, indexed simply and directly to the interview situation), its use by speakers to speak as a spokesperson was by far the most common type. That is, it was used as an exclusive rather than an inclusive ‘we’ (Sacks 1992a: 391, Johnson 1994), excluding the interviewer. This footing has already been seen in Excerpt 29, above, where it was contrasted with the interviewee’s use of ‘I’. The provisional tagging of ‘we’ as spokesperson was based partly on how interviewee and interviewer attended to such instances of ‘we’ and, where such attending was not explicit, on the analyst’s tacit understandings of the topic and of the interview¹⁵. Usually, ‘we’ referred in the first instance to the specific organisation identified above for each interviewee, and it is on these instances that the following analysis is based.

It is, by now, a commonplace that discursive practices are constitutive of organisations. Organisations are what they are because of the discourse about and within them; their boundaries and processes are defined textually, for example, formally in laws and

15. The analyst was also the interviewer on all occasions.

contracts and informally in marketing practices and public relations activity. It is this sense of organisation that is being used in this analysis. Certain instances of 'we' in the interviews, on this understanding, are not merely references to a pre-existing and unproblematic organisation, but are attempts to define or constitute that organisation in particular ways in a particular situation (an interview). Defining the organisation involves defining its boundaries and its environment, the latter including relevant other entities and the conditions for engaging with them in various ways. I shall discuss this in the first instance with reference to Excerpt 30, which comes from an interview between the researcher and a manager at the BLDSC.

Excerpt 30 (relating to Scenario 2):

- [1] Interviewer: What university external infrastructure is necessary?
- [2] Interviewee: Gosh, not quite sure what that means in terms of DSC answering; it is up to the university.
- [3] The external infrastructure, linking to the appropriate...
- [4] Well it does raise the interesting issue, which I am much concerned with, which is the external infrastructure, you get more and more complaints that libraries are finding it difficult to manage the multiple contracts that they are being offered and this is really a key issue.
- [5] Of course a number of people including us are addressing that and I tend to call it 'the race for the single channel', whoever gets to be able to provide the large majority of the information that researchers require, or staff require, through a single channel, they're the ones who are going to do well.
- [6] And so the external infrastructure, which is the point which we are particularly concerned about, is making sure that such a channel is available, down which can come all this information in whatever form the end-user wants it, as well as the intermediary I suppose.
- [7] Interviewer: Umhm
- [8] Interviewee: Because every university is different as you yourself well know.

- [9] Intermediaries regulate to a greater or lesser extent the access that end-users have and departments have to document supply.
- [10] I would have thought that the external infrastructure is making sure that the IT infrastructure is in place to allow for that.
- [11] I can't see how it is possible to build an external infrastructure that will take into account all the different systems that different publishers have to deliver their material.
- [12] I can't see that's possible, certainly that is the feedback that I get from some universities; that they are waiting for somebody to wave a magic wand, an electronic wand, and hoping it will be us.

The first thing to note is that utterance [2] questions utterance [1], clearly identifying the speaker as a spokesperson for 'DSC' and suggesting that this is an inappropriate position from which to offer the opinions apparently requested by utterance [1]. However, after reading a section of the interview schedule in [3], utterance [4] does go on to offer a description of an 'interesting issue' on which the speaker, as a spokesperson for 'DSC', can offer an opinion (once again, 'I' is doing opinion work). We see, then, that the invocation of the role of spokesperson can be used to restrict what can be said and, indeed, can be used as a resource to justify a particular interpretation of a question. That is, by saying 'I speak for this organisation', a speaker can imply 'and therefore I cannot answer questions relating to that organisation', an implication that configures the preceding utterance as just such a question. The speaker is, thus, to an extent freed from the expected obligation of an interviewee, which is to answer the question put, and is able to use 'I' in a different way to that of the librarian in Excerpt 29. That is, utterance [2] can be heard as implying that, given the question asked, the interviewee cannot fulfil the expected accountability and so must shift the ground somehow. This hearing is warranted by the phrasing of utterance [4], wherein a new issue is raised to which the interviewee (as 'I') can be accountable. While establishing the interviewee as accountable for subsequent descriptions and opinions, however, this shift has left the speaker's accountability as spokesperson for 'DSC' somewhat unclear at this point.

In terms of the organisational actor, the first person plural 'we', a competition ('race') involving 'us' is posited by 'I' in utterance [5], which is to structure the space ('channel') between 'information' and 'end-user'. This competitive lexicon is used frequently throughout the interviews to construct a context (the information chain) in which the speaker can talk of the interests and positions of the various actors mentioned in Question 5 of the interview schedule. The talk is not only descriptive, of course, but is used to include and exclude certain actors from the picture. 'Researchers', 'information' and 'we' are the only specific entities mentioned, although 'a number of people' are also involved in the competition. At the end of utterance [6], 'the intermediary' is parenthetically mentioned, a point to which I return below. The speaker has used utterances [5]-[6] to constitute the organisation with which he is in some way aligned ('us') as an actor included in and seeking to influence the competitive space between information and end-user. This alignment is available in the similar constructions of [4] ('I am much concerned') and [6] ('we are particularly concerned') although, following from the difficulties described above from utterances [1]-[2], the accountability of the speaker for the organisation is not clear. In his next turn, utterances [8]-[12], the speaker goes on to focus on the intermediary and publisher parts of the competitive space, finishing by emphasising a potential role for 'us'. Since this might be heard as rather self-serving (see 'Interests', below), it is noticeable that the potential role is described as being voiced by 'universities', a point to which I shall return below.

Use of the second person, 'you', is discussed in detail below. However, it is noticeable here in relation to the use of 'we' that 'you' is used twice, each time as a part of an interesting footing shift ('we'-'I'-'you'). In utterance [4], the speaker uses the first person singular to construct what follows as experience and opinion accountable to the interviewee, rather than the views of a spokesperson. However, he then uses 'you' as the recipient of 'complaints' from libraries. 'Complaints' are clearly an opportunity for the attribution of blame, and this use of the ambiguous 'you' can be heard as distancing this potential from the speaker. The second use of 'you', and accompanying shift in footing, is either side of the non-linguistic continuer that is utterance [7]. Again, the preceding sentence [6] has set up the speaker as spokesperson ('we'), then distinguished a

subsequent phrase as aligned with the interviewee identity ('I suppose'). Utterance [7] calls attention to this phrase and, in attending to the reference to the interviewee identity, the speaker in utterance [8] makes a strong appeal to 'you, yourself', that is the interviewer. This appeal constitutes bringing to bear a highly legitimate resource (the interviewer's own knowledge) in order to characterise universities and intermediaries as disparate. The reference in [9] to intermediaries completes the interviewee's attending to utterance [7] and sets up the topic as central to the rest of the speech turn.

As already noted, intermediaries are parenthetically mentioned in utterance [6] and are attended to in utterance [7], where they are describing as varying in the degree to which they regulate end-users or, in [8], as disparate universities. We saw in the analysis of Excerpt 29 how a librarian talked of 'regulating' end-users as a way of claiming to speak for their interests in terms of staking a claim in the information chain. In Excerpt 30, we can see this tactic at one remove. The role of intermediaries is supported by reference to the regulation of end-users (utterance [10]). Later in this speech turn (utterance [12]), intermediaries are, in turn, used to support a role for 'us'. This is achieved using a change of footing, where the opinion expressed originates not from 'I' but from 'universities'. This change of footing (Goffman 1981) can be heard as a construction of accountability by the speaker. That is, just as the librarian in Excerpt 29 constructed a library role by claiming accountability for the interests of end-users, so the interviewee in Excerpt 30 constructs a role for 'us' by invoking the interests of 'universities' which are asking him (in 'feedback') to be accountable. 'Interest' invocation is discussed further below. Thus, we can see how the legitimacy of a role claimed for 'us' is built up from previous constructions.

It is possible to see the construction of roles for intermediaries and for 'us' as being one aspect of a contrastive pair in the structure of the interviewee's second speech turn. That is, utterances [8]-[10] and [11]-[12] share structural features but have different (although related) topics. Variation is the predicate in each of the two parts. The subject is 'intermediaries' in the first part and 'publishers' in the second part. The 'circumstances' (Fowler 1991) are regulation in the first part and 'systems' in the second part. The two

parts are structured similarly, in that they each start with a description of the variation in terms of the subject and the circumstances and end with a resolution in terms of technology, expressed in terms of 'I', the interviewee identity. However, there are differences in the footings used in the descriptions and the resolutions. In the first part, the footing starts with an explicit appeal to the interviewer's knowledge as a warrant for the description ('you, 'yourself'). That the appeal is explicit constitutes, in Latour's (1987) terms, a 'negative modalisation'. That is, the description construction is visible, and therefore rhetorically weaker than a description that appears to reflect a state of affairs without the need for an explicit warrant. In the second part, the description of variation in publishers' systems is taken for granted and embedded in an assessment of the implications thereof (a 'positive modalisation'). The resolution of both parts of the contrastive pair are expressed in terms of an 'infrastructure' that is explicitly technological, 'IT' in the case of the former and 'electronic' in the latter part. However, the footing of the two resolutions differs. That of the first is simply indexical to the interview ('I would have thought that') and uses 'I' in the sense described above, constituting the speaker as an accountable interviewee doing opinion work. That of the second resolution starts in this way ('I can't see') but then shifts to the reported views of 'some universities' as a warrant for the opinion work that concludes in a role for 'us'. Thus, in the first part of the contrastive pair the description is weak and the resolution footing is direct, whereas in the second part the description is rhetorically strong and the resolution footing is indirect.

How does this description of what is going on in utterances [8]-[12] offer an insight into the category of technology? Regulatory technology forms the resolution to the first part of the contrastive pair. The speaker is able to take the technology part of this entity for granted; only the weaker part of the entity, regulation, needs an explicit warrant in [8]-[9]. In contrast, magical technology forms the resolution to the second part of the contrastive pair and both parts of this entity need explicit warrant in [12]. It is possible to argue that the difficulty with the second part is that the category of the resolution ('electronic') is of a similar kind to the category of the variation ('systems'), so that the category of technology is being asked to perform two conflicting discursive roles,

explaining difference and explaining integration. The latter role, explaining integration, is implicated in both parts of the contrastive pair with discursive support for the role of an actor; intermediaries in the first part and 'us' in the second part. The difference, as noted above, is in the locus of accountability, which is evidenced in the footing. One could say that the use of the category 'technology' in this way forms a kind of pattern or repertoire, that was hinted at in the analysis of Excerpt 29 (and in Chapter Six), that relates to the discursive construction (through footing shifts and accountability) and legitimation (through interest invocation) of roles for particular actors in the information chain. The split in the category or repertoire of technology enables characterisations of the information chain both as a problem ('variability') and as a solution ('us'), although a shift in footing is required to accomplish this in the interactive context of the interview.

In summary, 'we' is a complex footing that can be in conflict with the obligations of the interviewee in being accountable for descriptions and opinions given in the interview. 'We' clearly implies an accountability elsewhere. The second person as object, 'us', poses perhaps less difficulties and was used in discursive constructions of roles in the information chain. Other resources used in these constructions included accountability, interest invocation and the category 'technology'.

The second person – 'you'

The second person, 'you', was used in the interviews more often than 'we' but less often than 'I'. The second person case was used during the interviews in two main ways. Firstly, it was used in question-and-answer sequences. Secondly, it was used broadly in the sense of 'one'. Both uses are shown in Excerpt 31.

Excerpt 31 (relating to Scenario 1, or System A):

[1] Interviewee: Possibly, but I think it will be more, I think system A is more attractive because if you're going to devolve the payment then you've got customers out there who are going to want good service,

and good service to me is ten minutes not two days.

[2] Interviewer: Right. Just out of interest, who do you see as running system A?

[3] Interviewee: Um, um, well, there's potential there for an organisation like the British Library providing it.

Utterance [2] in Excerpt 31 is a simple question directed by the interviewer to the interviewee, and 'you' is used in this simple sense; the 'addressee', in Levinson's (1988) terminology. In utterance [1], 'you' is used in the sense of 'one', although it should be noted that this is not quite a straightforward alternative to the passive voice, as the use of 'one' as an actor is often considered to be (Sacks 1992a: 164). In utterance [1], this sense is somewhat conflated with that of the 'university librarian', since both payment devolution and customers (in this sense) are specifically campus entities. This second sense of 'you', therefore, offers a potentially analysable variation in the transcripts. In undertaking this analysis, though, the inclusive reference – 'you, here, now' – should not be ignored, even if it is apparently only a small part of the understood referent.

The first stage of the analysis involved an attempt to categorise the many uses of 'you' according to the implied referent (if any). According to this basic categorisation, the single most common use of 'you' indexed only to the interview situation as did utterance [2] in Excerpt 31. In addition, many other uses of 'you' appeared to be simple substitutes for the passive voice, without any clear sense of an alternative or additional referent. Of the uses of 'you' that remained, the vast majority were used to refer implicitly to an actor against whom the speaker aligned her/himself. It was this last category that was the focus of the rest of the analysis. The questions were:

- (a) what were the speakers doing when they used 'you' to conflate 'one' and a specific 'other' (what was achieved by doing this)?
- (b) What other textual resources, apart from 'you', were necessary for this achievement?

In these cases, although it was clear that speakers were referring to more than just ‘one’ in their use of ‘you’, the identity of the implied referent was sometimes hard to pinpoint. For example:

Excerpt 32 (relating to Scenario 2):

[1] Interviewee: ... Again even if you’ve a departmental account, the regulation of that is going to be difficult and some library liaison officers at the moment are more or less told how many books they can have.

In Excerpt 32, it is not immediately clear who has a ‘departmental account’, although it is clear that it is not just anyone. It is tempting to conclude that it is the hypothetical scenario that includes a ‘departmental account’, but that would be to argue that Excerpt 32 could be rewritten, without loss of information, as “Again, even if there was a departmental account...”. The loss of information in this rewrite relates to the idea, invoked later in the interview from which Excerpt 32 is taken, that someone is responsible for the ‘departmental account’ and that this actor might have incentives to regulate how the account was used. By using ‘you’, the speaker in Excerpt 32 acknowledges that particular actors might be involved but does not have to specify their possible identities at this point.

I argue here that the referential ambiguity in many instances of ‘you’ can be an important ingredient in the use of ‘you’, since it allows for controlled slippage in interpretation. In the first instance I shall discuss this with reference to Excerpts 33-35.

Excerpt 33 (relating to Scenario 2):

[1] Interviewee: So you [A] need an infrastructure that is not so sophisticated.

[2] You [B] have obviously got to have web access to the database, which I think is increasingly possible.

[3] You [C] don’t have the problem of printing large PDF files which you [D] have in system A, but you [E] have got that administrative

overload, or overhead not overload, of dealing with the declarations and administrating any rationing or charging mechanism.”

The five uses of ‘you’ in Excerpt 33 are labelled [A]-[E]. Instances [A] and [B] appear to be similar to that in Excerpt 32, where the referent is an (as yet) unspecified actor. However, instance [B] narrows down possible referents to those actors needing ‘web access to the database’. This specification continues with instances [C] and [D], where the actors are those likely to have ‘the problem of printing large PDF files’. Quite clearly, a possible interpretation of ‘you’ as ‘system users’ is available at this point in Excerpt 33. However, instance [E] shifts the footing away from this interpretation, toward the ‘system administrators’ as referents.

How can we understand the clear shift in the referent of ‘you’ in Excerpt 33? What resources are available to make it both hearable and comprehensible? I argue that what is being achieved is the management of two repertoires of technology-talk, that of technology as automation and that of technology as empowerment. The empowerment repertoire has been noted above as a way of invoking interests to legitimate the role of a particular actor in the information chain. The corollary of this is the automation repertoire, which serves the opposite discursive function; that is, it undermines the legitimacy of the role of a particular actor by characterising that role as better performed by machine. These repertoires are being skilfully played against each other by speakers to effect certain discursive outcomes. Let us take a brief detour via another excerpt from the same interview as Excerpt 33 in order to illustrate this point. Excerpt 34 takes place during a discussion of the outcome for researchers (‘they’ in utterance [1]) in Scenario 1 – or ‘System A’ as it was named in Excerpt 33. Here, the play of the two technology repertoires is fairly explicit.

Excerpt 34 (relating to Scenario 1):

[1] Interviewee: ...I think obviously that they have that huge advantage that they can have control and they can have the thing on their desks within ten minutes.

- [2] The library loses a lot of admin, possibly a certain amount of status in a fairly mealy mouthed sort of way; a sort of gate keeping function.
- [3] But a much more positive role of facilitating and ensuring that the system itself is appropriate to their needs, makes sure we have got something which is actually working properly as well.
- [4] There's a pretty important liaison with the technical side.

Technology as empowerment is a clear theme of utterance [1] in Excerpt 34, and technology as automation is equally clear in the first part of utterance [2], in which the library role is obviously under threat. The rest of the excerpt can be read as a particular resolution of the two repertoires in which the academic library role is assured. By the end of Excerpt 34, technology has ceased to be either automating or empowering, but is a matter for 'important liaison'.

The argument here is that a similar process is underway but unresolved in Excerpt 33, and that the slippages in the use of 'you' are an integral part of that process. As noted above, instances [A] to [D] of 'you' in Excerpt 33 posit an actor that increasingly slips toward referring to the system user. The vocabulary in this part of the excerpt is noticeably empowering, for example, 'access', 'increasingly possible', 'don't have the problem'. Then, as in Excerpt 34, there is a sharp shift to the automation repertoire, with the referent of instance [E] being the system administrator and the vocabulary, even ignoring the highly suggestive self-repair ('overhead not overload'), being clearly suggestive of automatable procedures, for example, 'overhead', 'dealing with', 'administrating'. Following the pattern established in Excerpt 34, we would then expect a resolution. Immediately following Excerpt 331 is the following:

Excerpt 35 (relating to Scenario 2):

Interviewer: Umhm

Interviewee: The role of the university library isn't challenged in anywhere near such a fundamental way...

The resolution of Excerpt 33, as that of Excerpt 34, is a continuing role for local academic libraries. Note, however, that Excerpt 35 (referring to Scenario 2) seems to contradict aspects of Excerpt 34 (referring to Scenario 1). Excerpt 35 suggests that the library role is challenged in Scenario 1, whereas Excerpt 34 seems to deny this. I will return to this apparent contradiction later.

So, why should the speaker use ambiguous instances of 'you' in Excerpt 33, rather than specifying whether he was talking about researchers or libraries, as he did in Excerpt 34? The issue in question is the legitimacy of the library role, so that the relevant context may be the competitive information chain as constructed in Excerpt 30, above. The ways in which interviewees oriented themselves to this context can be thought of as a linguistic discourse, or an example of systematic language use as a social practice. It is in some ways analogous to the conference debates among psychologists reported by McKinlay and Potter (1987) and, more generally, to the 'accounting for error' science studies discourse analysis reported in the literature review. In each case there is a struggle for legitimacy that takes place largely through text. McKinlay and Potter noted that politeness could be understood as a constraining factor in this kind of competition, since being seen to break certain norms of debate in the pursuance of rhetorical victory in fact only damaged one's case. Another way of thinking about this is the distinction drawn, for example by Halliday (1985), between the ideational and the interpersonal aspects of language use. The competitive discourse is broadly ideational in that it has coherent semantic content; the metaphor of a crowded space, of actors jostling for position, and so on. Interpersonal features of language use include politeness, as discussed by McKinlay and Potter, but also accountability; that is, the way in which the speaker negotiates their discursive roles as an interviewee and, in the case of this project, as a spokesperson for an organisation. The politeness regime is interpersonal in that it relates to the rules that govern how the competitive discourse can be deployed. I would argue that instances of 'you' are used in the interviews as a part of a politeness regime that structures the competitive discourse. That is, it is often most effective in terms of writing out a rival actor from the information chain to avoid being explicit. Using the slippery pronoun 'you' can help this avoidance in a number of ways.

Firstly, and as demonstrated in the discussion of Excerpts 33-35, using 'you' can help in managing contrasting repertoires in order to configure ongoing, viable roles that can be ascribed to particular actors (and not others). However, this seems only possible when the apparent contrast between the repertoires is not too conflictual. In Excerpt 35, as we have seen, the speaker admitted that his resolution in Excerpt 34 was not all that it might have been, suggesting that he had had some difficulty in configuring a viable role for the library given the textual constraints of Scenario 1.

Secondly, 'you' was used as an ambiguous pronoun that could refer to any or all of a number of referents. The most common example of this among interviewees not based at a university was in the use of 'you' to refer to an actor that might be described as 'the university in general'. As we shall see, this 'you' traded on including the interviewer in its reference – the interviewer was seen as included in 'the university in general'. Using 'you' in this way enabled the speaker to avoid specifying roles for particular units within the university such as academic departments, the library and the computing services department. For example, an interviewee from a database aggregator noted:

Excerpt 36 (relating to Scenario 2):

- [1] Interviewee: So typically the way it is going to work best is in a local environment, where you are able more easily to set up a system to select which users can use which aspect of the service, and who can access the document delivery service and which document delivery service or services you wish to use.
- [2] It is going to be easier to do that over the web I think, but typically many of the companies, including ourselves, who offer these services over the web, it is more difficult where Silverplatter say are having to maintain the information.
- [3] It is much easier if you do it.
- [4] You have greater flexibility in setting up configurations to suit your needs and changing them.

In this way, speakers from outside the university were able to configure the actor that they would prefer to deal with ('local', 'flexibility' ability to 'set up configurations') but avoided attributing necessary roles to any particular unit, and so avoided tying themselves to the fate of any unit. This implies that these speakers were constructing the university as a competitive arena in which any of a number of units might perform any necessary functions. Such a construction parallels that found in Excerpt 30, in which the information chain was characterised as a competitive space. At the same time, interviewees were including the interviewer ('you') in their account, configuring him as a 'university person', and thus supporting their subject position as spokesperson as well as interviewee. We can, then, also see this use of 'you' as a way for interviewees to manage these two different subject positions by reflecting their correlates onto the interviewer.

Other examples of the use of the ambiguous 'you' were where it was used to posit what might be called a 'global rational actor' in the hypothetical scenarios, by whose apparently neutral calculus certain outcomes were described in terms that made them seem almost inevitable. In this way, one set of available options could appear to be neutral and necessary, given the hypothetical scenarios. This approach is strongly related to the 'empirical repertoire' identified by Gilbert and Mulkay (1984) in scientists' accounts, in which scientific data were described as leading inevitably to theoretical conclusions. Excerpt 37 gives an example of this.

Excerpt 37 (relating to Scenario 1):

- [1] Interviewee: Like how many new buildings are you going to need over the next twenty years to store hard copy?
- [2] Well you are not.
- [3] But you are going to have to spend millions on electronic infrastructure, which people are at last beginning to realise at last now that eLib money is stopping for this sort of thing.

In Excerpt 37 the referent of the rational calculator 'you' is not clear, but acts as a discursive proxy, constructing a set of choices that have to be made and, by implication, defining (a) that an actor is required to make those choices, and (b) the type of actor that is required. As with Excerpt 36, the ambiguity of 'you' is allowing the speaker both to take a certain description of the relevant facts for granted (the choice between buildings and electronic infrastructure) and to imply the need for an actor to deal with these facts. However, just as the category 'technology' could be used discursively either to support or undermine the role of particular actors, so the ambiguous 'you' could also be used to challenge the legitimacy of certain roles. In Excerpt 38 a publisher challenges the legitimacy of the future role of the library by using an ambiguous actor 'you' to posit a different set of issues.

Excerpt 38 (relating to Scenario 1):

- [1] Interviewee: Which is why I think the prepaid account against which, you run down against a prepaid account, is probably the way to go, because then your spend is finite.
- [2] You would need some sort of administrative control because you wouldn't want...
- [3] Well, yeah, that's an interesting one...
- [4] You wouldn't want individual users running down on a central library account, so if the payment procedure is as I said under question one, if the library pays, then therefore document delivery has to go through a library administrator in order to run it down against that account.
- [5] So the average delay between a user's decision to have a document might be a little longer if they have to refer everything through the library.

As well as 'you' the holder of options and dilemmas, 'you' in both Excerpts 37 and 38 can again be analysed in terms of the management of twin subject positions and

accountabilities, within and outside the interview. As well as its use of the ambiguous 'you', Excerpt 38 shows many features that are discussed below, under 'Interests'.

In summary, the second person pronoun 'you' was commonly used in the interviews to refer simply to the other participant in the interview. However, 'you' was also used to achieve a number of discursive effects in the interviews, some of which relied on this first, indexical, sense of 'you'. An analysis of these uses has suggested that its common-sense referent of 'one' (that is, as an alternative grammatical formulation to the passive voice) was often supplemented by implied references to specific or more ambiguous actors. I have grouped an analysis of these supplemental references into two, although they overlap in practice. Firstly, 'you' was used to manage the interaction of prevalent repertoires, in particular those of technology as empowerment and technology as automation. However, the ambiguity of the 'you' referent could only accommodate this management up to a certain point. Secondly, the ambiguity of the 'you' referent was used, together with its conventional sense of 'one', to manage potentially sensitive attempts to interpret the four hypothetical scenarios in the interview schedule as implying the inclusion or exclusion of particular actors in the information chain. In none of these circumstances was the indexical 'you' irrelevant, and in many instances it was in use to manage two different accountabilities.

Deixis and subjectivity: concluding remarks

The deixis, transitivities and subjectivities examined in this section were those marked by the use of the first person singular, 'I', the first person plural, 'we', and the second person, 'you'.

The first person singular ('I') was used primarily as a way for speakers to present themselves as orienting appropriately to their role as interviewees. That is, the role of interviewee involves rendering accountable descriptions and opinions, and 'I' was a way of doing that discursive subjectivity. This task could be complicated, for example by

speakers' use of the first person plural ('we'), since that could be heard to imply accountability in a spokesperson role. Speakers had to manage any potential conflicts between these two sets of accountabilities.

'You' was found to be a useful device, enabling speakers to use controlled ambiguity in referencing and so to structure their utterances so as to prefer some inferences over others. Many writers have described the English language as nominalising (Halliday 1985), and so as allowing for the mystification of agency (Fowler 1991), for example in the availability of the passive voice. In the current analysis, the speakers used 'you' to control similar discursive effects, for example, enabling them to avoid specifying actors when that would be difficult, distracting or compromising for the point they were trying to make.

In the analysis of deixis / subjectivity, the interviewees' discursive moves could be understood as being addressed to what I have called a competitive discourse. There were two aspects to this. Firstly, interviewees described the information chain as a competitive space. Secondly they could be heard as configuring their talk in the interviews to construct this space so as to include or exclude particular actors. That is, not only were speakers describing competition, they were also doing it. Discursive resources available to them included use of the three pronoun families described above, but also interest invocation, the management of accountability and the boundary work involving the categories of scholarly communication, the information chain and technology. In some excerpts there was also evidence of a politeness regime that constrained overtly competitive or self-serving claims.

The category of technology is substantively relevant to this project. This seemed to involve a set of two repertoires, one repertoire being concerned with automation as a threat to roles and the other being concerned with technology as being in people's interests (empowering) and thus as legitimating the roles of those 'doing' the technology. The 'end-user' was often invoked in the latter repertoire. The repertoires tended to occur together or, at least, be addressed in close proximity to each other. I have shown excerpts

from the transcripts where the repertoires were being balanced and also where one was being invoked and the other avoided by using a different lexicon, that of finance. The repertoires were brought into play by interviewees as resources, with other resources, to support or undermine claims regarding roles in the information chain. Principal among these other resources were 'interests', and it is to these that we now turn.

Interest management in the interviews with information professionals

Introduction: focusing the analysis

To reiterate what was noted above, this analysis is concerned with how speakers invoked interests to do things in the interviews, for example as explanatory resources or to discount the views of others as ‘interested’, that is as self-serving. The analysis is not concerned with sociological issues such as whether a particular actor did or did not have an interest in putting forward a certain view.

The analysis is not concerned with conversations in which interests were commonly invoked to discount or otherwise alter the standing of versions (Antaki and Horowitz 2000), but with interviews wherein interviewees were asked for views relating to hypothetical scenarios. That is, there were few occasions when rival versions were in play, so that interests were rarely invoked to alter the standing thereof. Interests were invoked to do other discursive work, though.

In the discussion of deixis and subjectivity, above, certain marker word-families were used to focus the analysis on to particular sections from the large interview corpus. There is a similar need for focus in this section, but no apparent markers. Instead, I intend to make use of the structured nature of the interview to focus on discourse relating to one particular question that was asked of all the interviewees. This question, Question 5 (see Appendix A) seemed to act frequently as a prompt for the discursive attribution of interests to various actors in the information chain. Some examination of the structural aspects of that question is therefore called for. Question 5 asked, for each of the hypothetical scenarios offered to the interviewee, “Compared to journals on the shelf, who wins and who loses?”. The interviewee was being asked, therefore, about the likely outcome for recognisably real actors (such as publishers) in a hypothetical scenario. In addressing this question, the interviewee was able to deploy arguments relating to the interests and structural (for example, economic) positions of these actors. As a result, the discourse around the question was rich in examples of category entitlement and, in

particular, of the attribution of interests to recognisably real actors. It is in the discourse around this question, then, that the analysis of the interest attribution of interviewees is focused. The aim is to discover how such interest attribution was achieved and what discursive work it performed.

Structuring the discussion

Question 5 gave examples of five actors in the information chain on whom an interviewee might like to comment in terms of the likely outcome for them in the hypothetical scenario offered to the interviewee. These actors were publishers, suppliers, libraries, researchers and students. An additional option, 'no-one', was also included, but not taken up by any of the interviewees in any of the scenarios. Other actors were occasionally discussed by interviewees. Apart from this, and for the most part, interviewees simply ran through the five actors given in the question as examples of the information chain. We can say, therefore, that to a significant degree, the particular constituents of the information chain as discussed by the interviewees were a feature as much of the interview schedule as of the interviewees' responses to it. These constituent actors, as foci for the interviewees' interest attribution, provide one useful dimension along which to structure the analysis. However, this structure was less clear in interviews with people from what I have called 'commercial organisations' (see below), so that I have divided these up according to whether the focus of the analysis was on the interests of the interviewee's own organisation or on those of others.

In thinking about other possible dimensions along which to structure the discussion, an obvious candidate is the organisation to which the interviewee belongs. For example, in the introductory section of this study the interviewees were grouped according to whether they worked in an academic library, the BLDSC or a commercial organisation. However, ethnomethodological principles (Schegloff 1997) alert us to the problems encountered when the analyst imposes a particular context on data. For example, how are we to know *a priori* whether the important thing to know about an interviewee is their employer, their

gender or their shoe size? The wholly ethnomethodological approach is to see what aspects of the context are oriented to in the participant's talk and to take only those as relevant. This is, of course, an ideal. In practice, and especially in work such as the current study, the participants have been chosen for certain reasons and knowledge of these reasons is structured in to the data. In the current study, these reasons included that the interviewee worked in one of the three types of organisation noted above. However, we have seen in the discussion of personal deixis, above, that interviewees often used the third person plural, 'we', to indicate that they were speaking as spokespersons for their organisation, so that endogenous support for such a categorisation of interviewees is also present, and this categorisation forms the second dimension along which a discussion of interest attribution is here structured. This is not to imply that there was necessarily a common view or discursive elements to all the interviews from any particular category of organisation, merely that these categories were oriented to in the interviews and thus are a relevant context and a basis to structure a presentation of the analyses.

There are, then, two dimensions along which the discussion of interest attribution is structured. They are the actor being discussed and the interviewee doing the discussing. We can think of this forming a matrix, shown as Table 11.

Table 11: The structure of the section on interest attribution

Interests attributed to →	Publishers	Suppliers	Libraries	Researchers	Students
Interests attributed by ↓					
Interviewees working in academic libraries	1.1	1.2	1.3	1.4	1.5
Interviewees working at BLDSC	2.1	2.2	2.3	2.4	2.5
Interviewees working in commercial organisations	3.1 – Own organisation		3.2 – Other actor		

The numbers in each cell of Table 11 refer to the sections below.

1.1 Academic librarians on publishers' interests

A main feature of the attributions by librarians of interests to publishers was that the attribution sentences used (occasionally heavily) qualified forms more frequently than other attribution sentences. That is, librarians often used forms such as 'I assume...' or 'I think...' to preface their views of publishers' interests. For example, referring to Scenario 4:

39. "So publishers, possibly lose out quite a lot with because they're only supplying one copy of their journals to a document supplier"

Such qualifiers might imply that librarians did not want to appear confident in speaking for publishers. There are many possible interpretations of this. It may have been because librarians thought that the interests of publishers were so different to their own that it was difficult to discuss them. Alternatively, it may have been because librarians did not consider that they knew enough about publishers to offer a view. Where interests were attributed, they were almost always financial, for example, referring to Scenario 1:

40. "If the publishers have been compensated then they're not going to lose"

However, another explanation is possible. Consider the following excerpt, in which a librarian offers a similar rationale for not discussing publishers' interests further:

Excerpt 41 (relating to Scenario 1):

[1] Interviewee: As far as the suppliers and publishers are concerned, I'm happy to go along with the view that publishers will not make access available on the web or on any other means electronically unless it satisfies their commercial interest to do so.

[2] So in a way I opt out of all responsibility for suppliers' and publishers' well being, but I don't know whether they would gain or

not.

[3] I don't believe they will allow themselves to lose knowingly.

Here we see a librarian in utterance [1] constructing publishers as having commercial interests and being able to make relatively free choices as to how to pursue them. This can be read as another construction of the information chain as a competitive space populated by calculating, self-interested actors. This construction has implications for the speaker as a librarian, and these are spelt out in the second sentence where the speaker denies both responsibility for and knowledge of the fate of publishers. However, note that this otherwise rather emphatic invocation of the competitive discourse is hedged ('in a way'), marking a possible reference to the politeness regime discussed under 'Deixis and subjectivity', above. That is, what I have called 'politeness' constrains the availability of the competitive discourse, making it possible to hear any unconstrained invocation of it as self-serving and challengeable.

It is not clear from the transcripts whether librarians used qualifiers and hedged when discussing publishers' interests because of a perceived lack of knowledge or as a result of the politeness principle. It is more than likely that the serials crisis of the 1980s and 1990s, wherein publishers consistently increased serials prices above the rate of inflation (and library budgets were growing, if at all, less than this rate), influenced the construction of publishers apparent in the previous excerpt. These circumstances could easily have led librarians to wonder what publishers' interests were and to conclude that they were far removed from the academic library world. If accepted, this line of argument would support the thesis that the qualifiers and hedges were due to the politeness regime rather than a perceived lack of knowledge.

In terms of technological discourse, it is evident in Excerpt 41 that the empowerment repertoire ('access', 'available') is invoked, but that the speaker does not then use the automation repertoire to challenge the role of publishers. Instead, their commercial interests are invoked to support their role, albeit reluctantly. We saw above in a discussion of 'I' how a speaker shifted from a technology repertoire to one based on

finance so as to avoid using the automation repertoire. Again, here, we see how a commercial lexicon can be used instead of the automation repertoire, as complementary to the empowerment repertoire. This appeared to function because, whereas the automation repertoire writes out other actors, the commercial lexicon draws on an individualist ethic wherein accountability is legitimately limited to the self. That explanations using both automation and commercial lexicons were successfully used by those working in the information chain suggests that these two themes are in some way constitutive of it.

1.2 Academic librarians on suppliers' interests

The word 'suppliers' was often ambiguous to the librarians interviewed, even more so as 'suppliers' were, in differing ways, implicated in each of the four hypothetical scenarios presented to the interviewees:

42. "You have got here 'suppliers'; do you mean people like this?"

The first part of this sentence refers to the wording of Question 5 of the interview schedule, the second part to the description of the hypothetical Scenario 2. The speaker is unsure whether the two 'suppliers' are the same kind of actor.

Certainly, some librarians either equated or grouped them with publishers, and this grouping constructed an actor who was, again, discussed in terms of the competitive and / or commercial lexicon. However, I will focus here on those occasions when suppliers seemed to be understood by speakers as discrete actors. On these occasions, librarians could be less reserved in attributing interests to them than they (librarians) were in attributing interests to publishers. Suppliers' interests were not just financial but specifically concerned with taking others' roles. For example, regarding Scenario 2:

Excerpt 43:

- [1] Interviewee: So, publishers, do they gain or lose? They maintain the integrity of their journals I suppose.
- [2] Suppliers, they are obviously the people that would try and get involved in these sorts of systems, the Ebsco-kind of initiative, because they haven't really got a role in life, they don't actually contribute anything, they're trying to gobble up lots of things that aren't really their prerogative.
- [3] Libraries, yes they might gain because they don't have, they're effectively out-sourcing. I see this more like a general system for delivery which everyone would have access to. And I guess you are out-sourcing your ILL activities, and therefore you might gain on staff.
- [4] And researchers would gain probably because this is seemingly quicker than normal ILL services, I guess that's a plus point.
- [5] Students, I mean students are always in a bad position, because they are expected to use the old technologies... All these pretend arguments that they don't use journals or something, "they're gonna and use books and it's researchers that use journals and not students", it's obviously complete and utter poppycock. Their need for journals is just as much as it is for academics, but they would be disadvantaged by such a system because controls would be imposed upon student use.
- [6] University administration...

Excerpt 43 contains in utterance [2] a strong statement denying a legitimate role to suppliers. Qualifiers, such as they are, might be either hedges or intensifiers ('really', 'actually'). This part of the excerpt contrasts the baldly competitive discourse in which suppliers are engaged ('trying to gobble up things') with another discourse in which legitimacy is a matter of 'contributing' something and where activities are thus rightfully

claimed by actors. The other actors in Excerpt 43 that are described in terms of contributing something are publishers ('their journals') and libraries ('your ILL activities'), each of which is later related to a group of end-users. The interests of end-users are typically used in the interviews to legitimate or deny the roles of certain actors (see 'researchers' and 'students', below). What might be considered the product of suppliers, individual articles, are not mentioned at all. Hence, legitimacy is accorded to both publishers and libraries, but not to suppliers, who are merely self-interested. In this excerpt, then, a competitive lexicon is compared unfavourably as a source of legitimacy to another lexicon that emphasises scholarly ('journals') or professional ('ILL') matters. Another way to think of this distinction is in terms of the 'politeness regime' that, as was noted above, should constrain the deployment of a competitive repertoire. The interviewee in Excerpt 43 strips suppliers of the necessary politeness in their behaviour, delegitimising them.

1.3 Academic librarians on their own interests

Discussing one's own interests can be problematic. There are expectations, especially perhaps on such characteristically public-oriented people as librarians, that imply that self-interest is not a legitimate interest in and of itself. As we have already seen, interest attribution is a common tactic in undermining accounts. The tactics used by speakers to avoid appearing self-serving were a valuable resource in analysing the subject positions available to them.

Library interests were highly varied, but the most common related to the library's identities as a campus unit and as an actor in the information chain. It was common to support the expression of these interests by invoking the interests of end-users (see 'researchers' and 'students', below), who were perhaps seen as the library's contribution to the discursively constituted information chain and who were also powerful legitimating resources in a campus environment that was described as increasingly modelled on the market. Librarians were often quite candid in describing the library's

interest in local campus public relations. In the light of an expectation that such interests would be problematic, we might conclude that the interviewer was ascribed a supplemental position of 'colleague'; one who understood campus politics. The subject position of the interviewer was relevant in other ways, too.

In terms of the discourse between speakers, the hypothetical scenarios and the questions outlined in the interview schedule (see Appendix A), I will analyse two excerpts, 44 and 45:

Excerpt 44 (regarding Scenario 1):

[1] Interviewer: So users benefit quite a lot then?

[2] Interviewee: Yes I think they can do.

[3] They just need to get into the thought process of looking for it online rather than trotting downstairs to the journals.

[4] For staff and researchers, they definitely seem to like it, a lot of them do use electronic journals from their desktop and they love that they don't really want to come to the library to look at things.

[5] And I think they like the idea of downloading and printing off.

[6] And also access from home helps things as well.

[7] I would imagine also, although I haven't spoke to anybody about it, the idea you can go to a publisher's site or say JournalsOnline and you can search for particular subjects areas, so you don't particularly have to know a particular article exists, so I think that improves their usage of them, they can use it to help research perhaps rather than knowing that an article exists.

[8] Interviewer: Yeah

[9] Interviewee: In terms of the library, in terms of PR it's excellent really, because we can say that 'we are up with the new technology and you can access this from anywhere by the touch of a button'.

[10] It does mean that we can always say to people 'if that journal's not

there have a look online’.

[11] It does provide a better service in that way.

[12] I don’t know what the situation would be if we got rid of the print copy and just had electronic. I think we would still win...

This excerpt is rich in the discursive features identified so far in the analysis and, in addition, displays aspects of self-interest management. Utterance [1] both summarises what the interviewee has been saying in previous turns and calls on her to expand on it. In responding, the interviewee first hedges, changing the phrase of utterance [1] (‘users benefit’) to ‘I think they can do’. This has two effects. Firstly, it suggests that conditions exist wherein users might not benefit, and these are explained in utterance [3], which might be heard as removing a potentially blameworthy circumstance for the library should users turn out not to benefit. It also embeds the issue of ‘users benefit’ as a personal opinion by using the footing ‘I’. This footing (‘I’ as interviewee) is maintained throughout this speech turn and acts to address the ‘spokesperson’s’ problematic lack of a category entitlement to speak for users. It is carried to an extreme at the start of utterance [7], ‘I would imagine also...’, in which several interesting footing and transitivity changes occur, although there is not space to analyse them here. The lack of category entitlement with regard to users’ interests is in stark contrast to utterances [9] and [10], wherein the library’s interests are not a matter of personal opinion but are expressed directly by the speaker as a spokesperson. The difference is evidence of the speaker attending to their role as a librarian rather than as a user, and attending to the supplemental role of the interviewer as ‘colleague’ or as at least linked to library concerns.

The library’s interests are expressed in utterances [9] and [10] as discursive; Scenario 1 enables the library to say things to other campus actors in an imaginary interlocution. The library can say ‘we are up with the new technology’ and ‘if that journal’s not there have a look online’. Being able to say these things constitutes providing a better service. Whereas the latter phrase is clearly addressed to users (and so is another example of the invocation of users’ interests in legitimating those of the library), the former phrase might

be addressed to any of a number of campus actors. Although the remainder of the phrase ('and you can access this from anywhere...') suggests that, again, users are being addressed, the contextualisation of the phrase as 'PR' suggests that other actors are, if not the 'addressee' (in Levinson's 1988 schema), then a possible 'target'. These other actors may include the university administration that allocates funds. Although I am sure that none of the librarians interviewed saw the interviewer as a representative of such administration (and there is evidence for this in the transcripts, see above), they were aware that the interview was serving as data for a project (FIDDO) that might influence general policy or practice in regard to library funding. Hence, it is not so far-fetched to suggest that interviewees might orient their utterances to addressing this issue. The following excerpt, (45) is specifically oriented to the issue of funding, and identifies another potential problem in invoking users' interests in justifying the library's role:

Excerpt 45 (regarding Scenario 3):

- [1] Interviewee: Role of the library here is obviously more central than the others, and it's more visible as well.
- [2] I suppose if you're really paranoid about the vice chancellor giving you enough money, or thinking that everything can be done electronically, then you want a visible system.
- [3] That's where the survival of the library can be in conflict with what's best for the user.

The first thing to note is that, at the time of the interviews, Scenario 3 was the closest to normal practice in academic libraries and the least technological. In utterance [1], this scenario is indexed 'here' and described as potentially beneficial for the library as a campus actor. However, in explaining this in utterance [2], the speaker distances herself strongly from this view by shifting footing (from 'I suppose' to 'you're really paranoid'), by describing the explanation as grounded in pathology ('paranoid') and by using an intensifier ('really'). The reason for such a strong discursive distancing between the speaker and the view expressed in utterance [2] is the conflict between the library's

interests as an illegitimate competitive concern only with the acquisition of institutional funds and as an institution set up to serve the interests of the user. By resting the benefits of Scenario 3 firmly on the illegitimate grounds of intra-institutional competition for funding, the potential benefits of Scenario 3 are undermined. I shall return to the discursive effects of the non-technological Scenario 3 in Excerpt 48, below.

It is interesting to note the contrast in the meaning (use) of the category 'technology' between Excerpts 44 and 45. In Excerpt 44, 'technology' was invoked as giving the library a voice in the institution, whereas in Excerpt 45 the risk is that technology (things 'done electronically') makes the library invisible. Here we see a good example of how what might be termed the ideological content of the category 'technology' is not fixed, but can be varied to suit a number of argumentative purposes (Wetherell 1998).

In terms of the library as an actor in the information chain, the structure of the interviews meant that librarians tended to be discussing the likely outcomes for the library in the four scenarios immediately after discussing those of publishers and suppliers. Perhaps for this reason, a set of interests was apparent in librarians' answers which concerned the library as a player in the academic information chain, where it had an interest in ensuring its place. This chain had generally been characterised as a competitive space in librarians' discussions of the interests of publishers and suppliers (see above). The fact that librarians picked on suppliers as the unnecessary link in the chain should probably be read at least partly in the light of a general assumption that a 'shakeout' of the chain was underway, and that librarians were defending their corner. In the following excerpt, a librarian seems to see publishers taking over the role of suppliers for this reason:

Excerpt 47 (relating to Scenario 2):

[1] Interviewee: I think what's interesting in this one relating to publishers and suppliers is the way in which way this kind of scenario changes their role or extends their role beyond publication if you like into document delivery.

- [2] I think that is quite interesting, and I would have thought that it was quite a positive for them, but it's kind of leading into unknown territory.
- [3] Interviewer: Well it's leading into other people's territory
- [4] Interviewee: Yes, indeed unknown to them.
- [5] And that does seem to me to have all sorts of quite wide ranging implications long term.
- [6] But if you start from the general perception that shorter the chain of involved parties, the fewer the number of involved parties in the scholarly communication chain the better (and I think I would start from that as a broad assumption) then I would think that's a positive thing.
- [7] It's a bit tough for the British Library which has done a good job, and which might eventually suffer as a result of all this, but it's only there to do a job, it's a service, it doesn't really matter in itself.

What is being left out here, as interviews with suppliers and a publisher demonstrate (see below) is the possibility that academic libraries might be the ones to be 'written out'.

1.4 Academic librarians on researchers' interests

As has been demonstrated several times above, librarians sought to speak for researchers in their (librarians') discursive attempts to render the library an essential feature of both campus and the information chain. In addition, and cross-cutting this competitive repertoire, the 'technology as empowerment' repertoire was often grounded in the interests of researchers (and students). However, researchers' interests were not unproblematically available to librarians. I will discuss these issues with reference to the discursive features of Excerpt 48, which is a complete speech turn addressing the non-technological Scenario 3.

Excerpt 48 (relating to Scenario 3)

- [1] Interviewee: System three.
- [2] Users input their requests for documents...
- [3] Obviously the university library has got to be properly financed for research and teaching and it's not clear that a library operating in system three is properly financed, compared with having the right full text databases available for its researchers.
- [4] And it's not clear where the researchers find out about the articles that they want.
- [5] The advantage is if you're going the other way, I can see an advantage in that the researcher hasn't got to find out which database contains a particular journal, electronically, which in which today's rather chaotic situation is a problem.
- [6] The researcher is giving that problem away.
- [7] So a management researcher has got a journal article in front of him has got to find out whether its on ABI Inform, ProQuest Direct, SearchBank, Ideal or blah blah blah.
- [8] And that could be a time consuming process and not for the benefit of the researcher.
- [9] So the library takes on the transaction costs in this sort of environment.
- [10] So publishers, probably maintain their journal.
- [11] Periodical suppliers, well they possibly do lose out because there is a big incentive for the library to reduce its collections more and more to a very small core, and expect researchers and students to go through this system.
- [12] So they probably do lose out.
- [13] So publishers probably do lose out to some extent as well for the same reason.
- [14] So that's probably a serious effect of this kind of system.

- [15] So the university administration probably gains under this system, because they can see ways of cutting the core, both the quantity and quality of the service.
- [16] Who knows whether they are concerned with the quality.
- [17] So researchers, well they must be dependant on other sources for their information and librarians, information managers tend to doubt whether they're going to find all the materials strictly relevant.
- [18] Most researchers don't seem to worry about that in practice, a few do, but a lot don't.
- [19] They assume that their own networks are sufficiently well developed and powerful to find out what's going on in the subject.
- [20] Students, I think that all the things that put control on students and what they can access, in my liberal way of looking at education, is a disadvantage, and there is more control in this system.

Utterance [1] introduces the speech turn as being concerned with Scenario 3 (see Appendix A). In utterance [2] the speaker starts to read out the description of the scenario but trails off. As soon as the speaker addresses the scenario, he immediately invokes researchers' interests, which are in having the right full text databases or, in utterance [4], in being able to find out about the articles that they want. These interests are used to justify the university library being 'properly financed'. However, in utterance [5] the speaker notes directly contrasting interests of a researcher who, in other circumstances, does not have an interest in databases; quite the opposite. However, this too is used to support the library role, in that the work that a researcher might do identifying articles is now given away to the library, so saving the researcher time. Here we have two interests of researcher(s), in comprehensive discovery tools and in saving time, both of which are invoked to support the library role. These two interests could be seen as constructing the researcher in two different networks, marked syntactically by the use of the plural and the singular form, the networks being respectively the information chain and the campus.

The speaker attends to researchers (plural) in the information chain later in the excerpt, in utterances [17]-[19], where they have a range of options for resource discovery and the library is not necessarily the best one. Here, then, the librarian has to convince researchers that their interests are in allowing an information professional into their work. One aspect of this convincing, that of constructing the information professional as a professional, is apparent in the self-repair in utterance [17], wherein the speaker changes his description from 'librarian' to the, perhaps, more legitimate 'information manager'. The speaker takes advantage of the use of the plural form 'researchers' to disaggregate this category in utterance [18] according to whether they worry about the things information managers worry about. This is a delicate issue, since as well as being potentially an obviously self-serving argument, the speaker is in danger of suggesting that some researchers are incompetent. To avoid these problematic possibilities, the speaker hedges throughout utterances [17]-[18], for example, 'tend to doubt' and 'don't seem to worry', rendering these utterances less strident than they would be otherwise. The result is that the speaker in utterance [19] cannot assert a library role, merely hint at it by the use of the word 'assume', leaving open the issues of whether researchers' assumptions are justified, and who should decide. However, the splitting of the category 'researchers' in utterance [18] can be seen as a device to render their interests discursively available to the speaker, as a librarian. The few researchers that do worry about the possible inadequacies of their own networks act to suggest that there may be grounds for others to do so, and so this disaggregation acts to support the speaker's use of 'assume' (rather than, for example, 'know') in utterance [19].

The campus is defined financially in utterance [3], and the library role in utterance [9] is also financial ('transaction costs'), so that this utterance can be heard as attending to the second network in which the researcher (singular) is constructed; the campus. In terms of being a context for researchers' interests, this receives less attention in this excerpt than the information chain, a pattern that seems to be repeated throughout the transcripts. This is, perhaps, because such interests require much discursive work (utterances [5]-[8]) to configure them appropriately as support for the library role. Interests that are already in terms of the information chain (those of 'end-users') are already so configured.

It has been noted above that technology was invoked as both empowering for users, often as a source of legitimacy for the speaker's organisation, and as automating elements of the information chain, usually those of organisations other than that of the speaker. We have also seen the empowerment repertoire complemented not by that of automation but by a financial discourse. This last is how Excerpt 48 begins, relating researchers' interests to library finances. This is contrasted, when the speaker moves from the plural 'researchers' to the singular 'researcher' in [5], with an unusual (in these interviews) move wherein technology is not good for the user. This unusual move seems to be related to discussions of Scenario 3, as in Excerpt 45, above. The description of Scenario 3 in the interview schedule names less specifically technological features than does that of any of the other scenarios. The discussion here, then, relates to a lack of technology, and this lack means that the technological repertoires are not deployed as usual. In this context, the inversion of the usual technology-as-empowerment repertoire makes sense since it serves to construct the scenario as abnormal. The corollary, that a lack of automation would support the library role, is amply deployed in [5]-[9].

1.5 Academic librarians and students' interests

Students and researchers were frequently grouped together by librarians as 'users' in what I have termed above their information chain network, so that the interviewer frequently had to make specific reference to campus issues such as office-based computing facilities or differing financial arrangements to elicit comments specifically about students' interests. I will discuss how librarians constructed these with reference to an analysis of the discursive features of Excerpt 49.

Excerpt 49 (relating to Scenario 1):

[1] Interviewee: Suppliers, obviously there are concerns there that journal agents are would be ignored, suppliers would be ignored in this sort of model because it's quite likely that the text information would be coming

- from the publishers rather than through an intermediary.
- [2] Suppliers might be seen to be losing out unless they were acting as an intermediary.
- [3] Libraries, I don't see why libraries necessarily should lose out if they position themselves to be the gatekeeper and facilitator, promoting the service to the user and being seen as the mechanism by which users can get access to this material.
- [4] Researchers obviously should win, much easier for them.
- [5] And students.
- [6] There's the argument about browsing of course which you might be familiar with - one needs the hard copy journal on the shelf to get a feel for the totality of the publication and the literature and information in the subject area.
- [7] Interviewer: How much of an issue do you think that really is?
- [8] Interviewee: I think it's a decreasing issue I think, my generation and older certainly feel that it's important to have the hands on experience in opening the volume and browsing.
- [9] But the younger generation of researchers who have grown up with the technology are much more interested in 'just in time' and the focused approach, but that may be wishful thinking.
- [10] And there's certainly from our point of view some evidence of impatience among students if they are confronted with printed abstracts for example, and what they want is the CD and the network service that gives them the precise information that they have been asked to find for their assignment, which probably is what they always wanted but in the past they had to go through the..
- [11] Interviewer: So there's a difference in expectations then?
- [12] Interviewee: I think that's true, University Administration, it should be neutral from their point view of the charges are much the same.
- [13] Interviewer: Do you think there would be a difference between researchers and students in terms of access to PCs or printers?

- [14] Interviewee: Well yes of course, my comments on winning and losing assumed access and that is obviously patchy.
- [15] If there is relatively easy access to the technology for everyone then obviously both students and researchers win.
- [16] While students are at a disadvantage in terms of not having a PC, they may have a PC but it may not be powerful enough to access this sort of system, then of course they will lose out.
- [17] And that's the difficulty of course academic libraries are in at the moment: we are having to maintain expensive hard copy collections and expensive electronic subscriptions, and we want to maintain both, but it's a heavy investment on the part of the institution.
- [18] I would hope that's a transient phase and that it will eventually settle down to perhaps smaller collections of hard copy material or indeed to an environment where students really do have portable computers that they can plug into the network and download the stuff they need.
- [19] Although of course the tradition of browsing would deplore that to an extent.
- [20] Interviewer: Mmm

Once again in Excerpt 49 we see the interviewee orienting herself to the structure of the interview schedule, in terms of the hypothetical Scenario 1 and Question 5. Utterances [1]-[2] exhibit interesting shifts in tense (between the present and the conditional) and self-repairs ('journal agents are would be ignored, suppliers would be ignored'), suggesting that significant discursive work is being undertaken here. This probably relates to the speaker's delicate task of denying 'suppliers' a role in the information chain. Utterance [3] can be heard as following on from this, since the position of libraries is addressed in terms of them not losing out, a term that implies that there is at least an implicit charge that they might, like suppliers, lose out. The focus then, in utterance [4], shifts to researchers and students.

The sequential ordering of utterances [4] and [5] certainly relates to the interview schedule, which prompts for answers in the order 'researchers, students'. However, there is then the question of who the subject is of utterance [6]; who is the 'one' who needs to browse? This is not specifically addressed in the interviewer's interjection at [7], but the interviewee's response to this interjection gives us a clue in [9], where 'the younger generation of researchers' is contrasted with others mentioned in [8] in terms of browsing. Hence, we can assume that [5], 'and students', is a fairly discrete utterance, and that students are not the subject of what immediately follows.

Utterance [10], however, is specifically about students' interests. This follows [9], concerning younger researchers, so that utterances [8]-[10] can be heard as a three-part list of users in decreasing order of age or status. Atkinson (1984) has remarked on the rhetorical effectiveness of three-part lists in political speeches, and here it is possible to hear this list as a review of the variety of demands on the library. That is, 'my generation and older' need to be able to browse [8], 'a younger generation of researchers' are interested in 'a focused approach' [9] and 'students ... want ... the CD' [10]. This variety of demands, including students' interests (to which I will return in more detail below), are recalled later in the excerpt, at utterances [17]-[19], where they are used partly to justify 'heavy investment' by the institution in the library. However, and as with researchers' interests discussed above, students' interests are not unproblematically available to the speaker to support the library role.

A relationship is asserted in utterance [9] between 'the technology' and a 'focused approach'. This relation is taken on in [10], relating specifically to students, where it is 'the network service that gives them the precise information'. Here, then, there is a contrast between two technologies, print and electronic, which relate respectively to browsing and to precise information retrieval. Students' interests are definitely with the latter, and there is discursive evidence both for the strength of this claim and of the interests themselves. Firstly, the relevant assertion, at the start of [10], makes use of both an intensifier ('certainly') and a category entitlement, the category being the eyewitness ('from our point of view') who has first-hand 'evidence' of students' interests. Secondly,

and unlike the interests of researchers in [9], those of students are said probably to pre-date the technology, making them seem authentic rather than opportunistic. Thirdly, students' interests are related to 'their assignment', that is, the interests themselves are warranted by the need to undertake a legitimate project.

Utterance [10], therefore, makes a series of claims about students' interests, claims that are marked by discursive devices that support them. Following the pattern of researchers' interests, we would then expect students' interests to be invoked to justify a library role in the information chain, and for the twin technology repertoires of empowerment and automation to be implicated in this invocation. I now consider the latter half of the excerpt to see whether this pattern is apparent. The issue of technology is explicitly raised by the interviewer in [13] in a request for the interviewee to differentiate between researchers and students. The interviewee's first response to this is to recast her previous turns as depending on access to technology in the way indicated by the interviewer and then, in [15], to return conditionally to the form in which she first addressed the question of researchers and students in utterances [4]-[5]. Utterance [16] then addresses the other side of the conditional, making student access to technology problematic at the moment ('while'). The role of the library is then addressed in detail in utterances [17]-[19], and it is here, especially in [18], that the interests of students and the technology repertoires are linked. The first clause of [18] takes up the temporal feature of [16], claiming that students' problems with accessing PCs are temporary but, lacking any support for this claim, hedges it ('I would hope'). The speaker then brings these problems into a hierarchical contrastive pair ('transient phase' / 'eventually settle down'). The hierarchy in this contrastive pair is emphasised by considering the speaker's senior position in the library, a position compatible with long term strategy rather than any short-term contingency. A warrant for considering the speaker's identity at this point is given by the self-reference ('I') at the start of [18] which, earlier in the interview, is explicitly aligned with the library as a strategic actor. Hence, although the claim (that students' problems with accessing PCs are temporary) is not backed up, a discursive device is used to enable the speaker to continue speaking as if the claim were accepted. Thus, the speaker is able to revert to the first side of the conditional set up in [15]-[16].

At this point, the speaker is free to employ the empowerment repertoire of technology ('they can plug into the network') for students' interests in precise information retrieval ('the stuff they need') as constructed in utterance [10]. The automation repertoire is also apparent here, in that some of the tasks previously done by both students ('browsing') and the library ('maintaining expensive hard copy collections') are now not necessary. The speaker addresses the potential that this automation writes both students (as learners at the shelf) and libraries (as physical places) out of the information chain. The library becomes merely an 'environment', although we should recall that the speaker has already explicitly addressed the future of the library in utterance [3], so that the apparent threat to its identity need not be taken further in [18]. The activity of browsing at the shelf has also been addressed earlier (utterances [8]-[10]), so that the speaker is able to leave the issue unresolved in utterance [19]. It may seem that such reference back over a number of speech turns is unwarranted, but we should remember that this excerpt is taken from a highly structured interview, so that both interviewer and interviewee could rely on the schedule (which was present to both throughout) to act as a link between topics.

In summary, in Excerpt 49 students' interests are constructed, warranted, related to the library role and linked to the twin technology repertoires of empowerment and automation. To do this, the speaker uses a variety of discursive devices to support claims and make them accountable in the circumstances of an interview.

Students' interests, like those of researchers discussed above, were available (or were constructed to be so) to the speaker as a resource to legitimate particular assessments of the scenarios in the interview schedule. In this sense, there is a parallel between the discursive role played by users' interests in these interviews and the role played by 'data' in the empirical repertoire identified in scientists' discourse by Gilbert and Mulkay (1984). In the latter case, scientists constructed their accounts such that their theoretical positions were apparently inevitable, given the data presented; the data led inexorably to the theoretical position. A similar strategy is visible in the excerpts above (and others below), wherein users' interests lead inexorably to a positive or a negative assessment of a particular scenario. However, the scientists' data had to be 'black boxed' or inoculated

against deconstruction in order that its consequences could be seen as inevitable. Similarly, boundary work is required on the part of interviewees in configuring users' interests as, on the one hand independent of the information chain and, on the other hand, consequential for it. The category of scholarly communication served this purpose, as defining practices outside the scope of the information chain, for which librarians (and, as we shall see, other interviewees) were not accountable, and yet which could be invoked as legitimating users' interests.

2.1 BLDSC employees on publishers' interests

I shall discuss how BLDSC employees constructed publishers' interests with reference to the following excerpt, 50.

Excerpt 50 (relating to Scenario 1):

- [1] Interviewer: Who do you think would win if system A became fairly prevalent, compared to journal subscriptions, and who would lose?
- [2] Interviewee: The being able to access individual documents like this really gives people the, it's an access versus holdings.
- [3] In other words, if the item you want is available in that sort of format then you are less likely to subscribe to a journal with a whole range of articles.
- [4] With this you are finding the information you want and downloading it immediately, so it is more of the just in time rather than just in case.
- [5] Obviously this is the one thing, the losers - perhaps - are publishers here, where obviously they are going to be concerned that they make their money from journal subscriptions and as this becomes more and more prevalent, then people are not going to see a journal as such.

- [6] All you are going to see is an article, because all you have done is you have searched the database, you have found an individual object that you want, not a journal that you want.
- [7] Interviewer: The unit of analysis has changed.
- [8] Interviewee: Yes.
- [9] That, I think, is the losers there, and there are publishers who have recognised that the subscription model is perhaps becoming more outdated now as more of this type of technology becomes available.
- [10] Obviously they have got to find some way in which they can replace it, and what I am not sure about is here you have said the full text is copyright cleared, and it's a question of where the publisher fits into this.
- [11] It could be that that digital document is actually published by the library. There is no publisher as such.

In utterance [1] the interviewer more or less speaks the text of Question 5 from the interview schedule. In response, the interviewee initially offers two incomplete sentences, recognising them as inadequate in themselves by starting [3] with 'In other words'. The first of these incomplete sentences sets up 'people' as an actor, but this sentence is aborted to be followed in [3] by a description that sets up 'you' as a second actor wanting an 'item' or 'information' rather than a 'journal'. Why does the speaker change from 'people' to 'you'? In the discussion of deixis / transitivity, above, uses of 'you' were analysed and it was found that this word was often used where the speaker wished to avoid making specific reference to an actor. The alternative here is not an actor as such but the general plural 'people' in utterance [2]. There is some indication that 'you' in [3]-[4] is singular (especially if allied to [6]), and that this contrasts with 'people' in [2], so that the speaker is drawing attention to singular entities in [3]-[4]. This allows him to draw the comparison between 'the item' and 'a journal' upon which the rest of this speech turn is based. A comparison based on plurals would be more problematic given that, in this case, 'journals' are made up of 'items'. However, there is more to it than this. Utterances [3]-[4] are about events on campus in the scenario given,

whereas the location of events in utterance [2] is not clear. Certainly, ‘access versus holdings’ is an issue of more general relevance to the information chain rather than specifically to the campus-based example scenario. In utterance [5], publishers are mentioned for the first time in this excerpt (and in the interview as a whole) in a hedged account of Scenario 1 that has them as ‘the losers’. This is explained in terms of a link between money and journal subscriptions. The reference to the information chain entity ‘subscriptions’ (plural) is followed by the second reference to the plural actor ‘people’, which is in turn followed by a return to the singular ‘a journal’. The structure of this clause supports the suggestion made above, that ‘people’ is used as a plural actor when the speaker is discussing the information chain (‘journal subscriptions’, ‘publishers’, ‘access versus holdings’), whereas ‘you’ is used as a singular actor when the speaker is discussing campus entities (‘a journal’, ‘finding information’, ‘downloading’). The distinction is not absolute, but there does appear to be a pattern. Hence, following from the campus event relating to a singular entity (‘see a journal’) that finishes utterance [5], we see the reinstatement of ‘you’ as the actor in utterance [6].

The speaker in utterance [5] explicitly attributes the interest of money to publishers, which links publishers to journal subscriptions and to how Scenario 1 is problematic for them. The interests of the campus actor ‘you’ are in individual items, not journal subscriptions, whereas the alternative actor, ‘people’, does not seem to fit well into Scenario 1 at all – the speaker uses the word twice and on neither occasion is the actor sustained sufficiently to require the pronoun ‘they’. Hence, in utterances [2]-[6], the speaker has set up two actors with contrasting interests. Publishers are interested in subscriptions whereas ‘you’ (probably the user) is interested in individual articles. The interviewer in [7] summarises this as a change in the unit of analysis, with which the interviewee agrees but goes on to explicate. Given the contrasting interests of publishers and users, the position of publishers in utterances [9]-[11] becomes less and less secure. In utterance [9] some of them have recognised that their revenue model is outdated, in utterance [10] the question of copyright leads the speaker to question where a publisher would fit in, and in utterance [11] ‘there is no publisher as such’. This is a clear example

of the interests of users being invoked to discursively undermine the role and interests of an actor in the information chain.

The twin technology repertoires with which we are familiar are also implicated in this undermining of the role of publishers; empowerment for users as a warrant for automating out an actor in the crowded information chain. That the speaker views Scenario 1 as technology is apparent in utterance [9] when he refers to 'this type of technology', so that utterance [4] can be heard as the empowerment repertoire in which users are 'finding the information you want and downloading it immediately'. The legitimacy of this is not questioned, but instead this activity is used in utterance [9] to question the legitimacy of publishers interests. The results, finally, in utterance [11], which is a clear 'automating out' of the publisher. Note that the category of scholarly communication remains constant throughout this process, consisting of articles. Again, it serves as the bottom line source of legitimacy (outside the information chain) for users' interests in technology-as-empowering.

In contrast to the speakers from academic libraries discussed above, the interviewee in Excerpt 50 directly challenges the role of publishers. The discursive tools he uses for this challenge are familiar and include shifts in footing, interest attribution and the technological repertoires.

2.2 BLDSC employees on suppliers' interests

Of course, the BLDSC is a document supplier, so that the topic of suppliers' interests had the potential to make the interviewees' arguments regarding the hypothetical scenarios in the interview schedule appear self-serving and challengeable on these grounds. I have chosen an excerpt, 51, therefore in which this issue is addressed, if obliquely, even though its analysis is less straightforward than others in this section.

Excerpt 51 (relating to Scenario 1, or 'System A'):

- [1] Interviewee: ... System A is going to cost quite a lot of money, unlimited access.
- [2] Interviewee: There are always in any university especially one with a research commitment, there will be a significant number of researchers who will go barmy if there is free rate access, free access to material, they'll get hundreds of articles.
- [3] Interviewer: Right.
- [4] Interviewee: So one way and another, that's going to be quite expensive, which will put pressure on the journals on the shelf.
- [5] Interviewee: That won't necessarily harm the suppliers if they have made the right deals with whoever is supplying system A.
- [6] Interviewee: It's complicated isn't it?
- [7] Interviewer: Yes.
- [8] Interviewee: Because the supplier is a publisher, as well as a subscription agent.
- [9] Interviewee: Most people, everyone I would have thought in system A, will have to pay - you say all full text is copyright cleared.
- [10] Interviewee: So I think it is fairly public knowledge that we are negotiating with publishers for System A, to deliver a System A, but perhaps not with flat rate access fees, but we would not pay a copyright as such, we would pay a contract fee.
- [11] Interviewer: The licence?
- [12] Interviewee: Based on savings that we would be able to make internally.
- [13] Interviewee: I think it is quite difficult to make a general answer to that.
- [14] Interviewee: It all depends on the particular way in which the bargain is struck, whether the suppliers would win or lose.
- [15] Interviewee: The library; win or lose.

The first thing to note about Excerpt 51 is that the confusion over the word 'suppliers' is evident here, as it was when academic librarians were discussing suppliers' interests.

Utterance [8] shows this. However, here the confusion is attributed as much to the

hypothetical scenario as to the word 'suppliers', since [8] follows from [6], in which the interviewee states that the scenario itself is complicated. Suppliers are mentioned first in utterance [5] and are defined as distinct from the supplier of 'System A'. In utterance [4] the expense of System A is said to 'put pressure on the journals on the shelf'. That utterance [5] goes on to deny that this will necessarily harm suppliers suggests that suppliers are understood here as including those with an interest in journal subscriptions and, indeed, this is confirmed in utterance [8] where the speaker states that 'the supplier is... a subscription agent'. However, the supplier is also a publisher. Hence, the definition of supplier is expanded in utterances [5]-[8] to include many actors traditionally separate in the information chain. This contrasts with utterance [10], wherein the speaker begins speaking as a spokesperson ('we') for BLDSC and notes that the BLDSC is in negotiation with publishers to supply 'a System A'. There is certainly confusion here regarding who is the 'supplier', especially as BLDSC is usually understood as the major document supplier in the UK. Is something being achieved by this confusion? Certainly, and as anticipated above, it is difficult to see any simple attributions of self-interest in this excerpt, but how is this achieved without the appearance of evasion?

As noted above, in utterance [5] the speaker distinguishes suppliers from those supplying System A, who are in a position to make (or not make) deals with suppliers that may or may not 'harm' those suppliers. The supplier of System A has, therefore, been granted a powerful role in the information chain, with which publishers and subscription agents (utterance [8]) must deal. It turns out in utterance [10] that the BLDSC itself is vying for this role, and is engaged in the very negotiations described as 'the right deals' in utterance [5]. This might be thought as a challengeable move owing to it being highly self-serving, but utterance [10] also achieves two other effects to counter this potential challenge.

Firstly, utterance [10] makes use of and links the issues of payment and copyright that are raised in particular ways in [9]. This constructs the BLDSC as an actor engaged in financial and legal matters. The BLDSC is also in a relationship of negotiation with

publishers. There is an issue of confidentiality in these negotiations, to which the phrase 'I think it is fairly public knowledge' is addressed. This constructs the BLDSC as an actor engaged in contractual and commercial matters. Finally, utterance [12] defines the BLDSC as an actor capable of effective internal management. In this way the BLDSC is worked up as an organisation qualified to be a part of System A. The use of the commercial repertoire underpins this claim to legitimacy.

Secondly, it is at utterance [10] that the footing shifts from the hypothetical scenario that is System A to the real world, and where the interviewee speaks as 'we' as a spokesperson for BLDSC. That is, the speaker (as 'we') is now (at [10]) in the discursive space he set up for the supplier of System A in utterances [5] and [8]-[9]. Why has the interviewee done this? We should look for the answer to this in the persistent demands of Question 5 of the interview schedule, which are explicitly hearable in the interviewee's remarks in utterances [5], [9] and [13]-[15]. If we assume that it is to this question that utterances [10]-[12] are addressed, then how can they be heard as answering it? System A has already been constructed as a scenario in which deals and payments are central. Utterance [10] tells the interviewer that 'we' are engaged in making these deals ('negotiations') and arranging these payments ('a contract fee') in order to be a supplier of System A. Thus, although the details may differ ('perhaps not with flat rate access fees'), the interviewee is currently engaged in the very arrangements that make up System A. This has the effect of working up his category entitlement as an eyewitness (someone who was there), and so legitimates his version of the winners and losers in System A. The interviewee's explicit response to Question 5, given in utterances [13]-[14], is therefore warranted by his having direct experience of the matter and is difficult therefore to challenge on the grounds that it is evasive.

In summary, this excerpt is an example of a speaker constructing entitlement for both his organisation and himself in order to warrant an account of the BLDSC as a central but apparently disinterested actor in the information chain.

2.3 BLDSC employees on libraries' interests

Excerpt 52 follows directly on from Excerpt 13.

Excerpt 52 (relating to Scenario 1):

- [1] Interviewee: ... The library; win or lose.
[2] Is this financial or power?
[3] Interviewer: Just generally speaking.
[4] Whatever librarians are interested in.
[5] Interviewee: I mean again, I would have thought libraries, paradoxically...
[6] They lose in one way, they cease to have direct control over what people are reading if it is not immediately available to the researcher on the shelf, because the researcher is getting it all through this database.
[7] But nonetheless the library's got more power in terms of - what I said earlier - negotiating the contract, monitoring the contract, choosing more contracts, deciding what goes into the database, deciding how you allocate money between the database and material on the shelf.
[8] I can't see the libraries losing in any way.

In Excerpt 51, as argued above, the speaker characterises the information chain in respect of Scenario 1 as an arena of negotiations, deals and bargains. It is in this context that the interviewee addresses the question (read from the interview schedule) of whether libraries win or lose in this scenario (utterance [1]). In utterance [2], the interviewee directly addresses what are to count as the library's interests, the two options offered – perhaps influenced by the preceding section – being financial and power. Recognising this as a legitimate question, the interviewer makes two attempts to provide an answer, neither of which explicitly challenge the options given in [2]. The first attempts to broaden the topic from the two options offered by the interviewee. The second is an

explicit call for the interviewee to invoke librarians' interests. The interviewee introduces his response to this call in an incomplete sentence, utterance [5], which sets up what is to follow in at least three ways. Firstly, in 'I mean again', the speaker makes an explicit link to previous speech turns, implying that what he is about to say is consistent with, and even repeats, what he has said earlier. This can be heard as the interviewee taking utterances [3]-[4] as licensing his initial characterisation of libraries' interests as being either financial or concerned with power and thus as consistent with the way in which he has worked up certain identities for himself and his organisation in Excerpt 51. Secondly, in 'I would have thought libraries', the speaker hedges what is to come, making it a matter of his personal opinion. This framing of utterances [6]-[7] is recalled in [8], which closes the topic of libraries' interests by, among other things, recalling that the previous talk has been opinion ('I can't see'). The third way in which utterances [6]-[7] are set up in [5] is by 'paradoxically...'. This word does much discursive work. It anticipates that the speaker is about to describe contrasting versions of events or circumstances, but asserts that this contrast is benign and is not easily challengeable on grounds of logical contradiction.

The contrastive pair anticipated in [5] is explicitly signalled in [6] and [7] by the use in [6] of 'in one way' followed in [7] by 'nonetheless'. Utterance [6] can be heard as a simple invocation of both technology repertoires, where libraries no longer have 'control over what people are reading' (empowering) because material is not 'on the shelf' but is available 'through this database' (automation). As with previous examples of this kind of invocation of technology, the result is, at least potentially, to write out the named actor (in this case libraries) from the information chain. The speaker then addresses this potential in [7] in the second part of the contrastive pair. However, because the pair has been set up as paradoxical rather than, for example, as antagonistic, utterance [7] cannot easily be heard as denying the effects of the technology repertoires described in [6]. Instead, utterance [7] expands on [6] by specifying other effects and repertoires in which the libraries' role is not threatened. At this point the speaker reverts to exactly the language he has previously used (in Excerpt 51) to describe his own organisation ('negotiating', 'contracts'). Since this has just been successfully used to construct an

entitlement for the BLDSC, it is a highly legitimate repertoire at this point in the interaction and so is available as a counter to the technological repertoires in [6]. Indeed, it is so legitimate a counter that, in utterance [8], the speaker is apparently able to contradict what was said in [6] regarding whether libraries lose.

2.4 BLDSC employees on researchers' interests

Excerpt 53 follows directly on from Excerpt 52.

Excerpt 53 (relating to Scenario 1, or 'System A'):

- [1] Interviewee: ... Researchers is I think a question with only a complex answer to it.
- [2] Because researchers, the answer depends upon the discipline of the researcher in my experience.
- [3] For example, a medical researcher will almost certainly gain on system A.
- [4] A humanities researcher will gain far less from system A.
- [5] I haven't spelt out the reasons for that.
- [6] Medical researchers want very up to date links all this sort of stuff.
- [7] Humanities generally, they are not so much worried about currency.
- [8] They are more interested in monographs often than serials, certainly in a greater depth of serials and, arguably, in a greater breadth of serials, I'm not sure there's much research has been done on breadth, but the depth if not the breadth.
- [9] Interviewer: Yes.
- [10] Interviewee: So it depends upon what discipline that you are in and I certainly think it would be the case that many researchers across all disciplines depending on their psychology and their age, but also certainly some disciplines, will be quite resistant to this.

- [11] Because the world is not an ideal place is it.
- [12] If you are spending a lot of money on system A then you are going to be spending less money on journals on the shelf.
- [13] Some disciplines, and some people across all disciplines, prefer to browse on the shelf come what may.
- [14] So I think that is complicated.

As we have seen in the discussions of the preceding excerpts (51 and 52), the speaker has constructed the information chain as primarily concerned with deals and negotiations. Technology is another way of talking about the information chain, but in these excerpts it seems to be a secondary one. In Excerpt 53, however, neither of these is present, suggesting that this part of the interview is not about the information chain.

In utterance [1], as in the opening to Excerpt 52, the speaker marks a move in topic by reading from the interview schedule, 'Researchers'. One way that this is evidenced is by the disagreement between the plural noun phrase and the singular verb ('is'). The question represented by 'Researchers' is then described as having only a complex answer, a point to which I shall return. The answer, that is, whether researchers 'win or lose', is in [2] described as being dependent on a particular aspect of the identity 'researcher'. This identity is disaggregated by the speaker in utterances [3]-[4] according to subject area (a contrastive pair is used), a criterion that is explicitly justified in utterances [6]-[8] by reference to a feature of subject areas, the type of material required. Thus, there are three levels of assertion in this sequence: the first relates to the question the interviewee is asked to address (it is complex and depends); the second relates to the differential outcomes of the scenario for each of two groups of researchers; the third relates to the reasons for these differential outcomes. We can see, then, that this is another three-part list, each successive part explaining the previous one so that the logic of the whole explanation depends on the characterisation of types of researcher given in [6]-[8]. At first, in utterances [6] and [7], these characterisations are merely asserted, although [7] does contain a slight hedge ('generally'). That is, the speaker up to this point has not worked up any entitlement that might allow him to know the interests of

researchers and deploy them in an answer. It would seem, then, that utterance [8] is key to legitimating the whole sequence [1]-[7]. In addition, utterances [7] and [8] are framed as another contrastive pair ('not so much worried' / 'more interested'), so that the expectation of [8] is that it will contain some positive interest of humanities researchers that will, in turn, contrast with the interests of medical researchers. How does utterance [8] deal with the multiple roles placed upon it by the preceding utterances?

Utterance [8] is wholly concerned with scholarly communication, and is framed as a three-part list, each part of which compares the interests of humanities researchers with those of medical researchers (monographs rather than serials, greater depth of serials, greater breadth of serials). In this way, [8] answers the expectation of it in terms of the contrastive pair framed between it and [7]. These three comparisons are stated with markedly different force. The first is mildly hedged ('often'), the second is strongly intensified ('certainly'), and the third is heavily hedged ('arguably', 'I'm not sure...'). The strength of the second comparison is intensified further by the reference to 'research' (a highly legitimate source given the topic) in the third part, implicitly contrasting the apparent lack of research supporting the third comparison with the support for the second. Thus, in effect by sacrificing the third alleged distinction between the interests of the two groups of researchers, the speaker strengthens the legitimacy of the overall claim that the interests of the two groups are distinct, the claim that is the grounding for the excerpt as a whole. Another way to see utterance [8] is as a three-part 'show concession' (Antaki and Wetherell 1999) consisting of assertion ('greater depth'), concession ('not breadth') and reassertion ('depth if not breadth'). Either way, the effectiveness of the rhetoric and its completeness is acknowledged by the interviewer in [9]. Its effect is a dramatic demonstration that, if users' interests and the scholarly communication category on which they are founded are deconstructed, then they become impossible to relate to the information chain. To be discursively used by information chain practitioners, users' interests (scholarly communication) need to be independent of and yet consequential for the information chain.

Following the interviewer's interjection at [9], utterances [10]-[13] review the discursive achievement of [1]-[8], introducing further variables, other than discipline, that might affect researchers' interests. Like discipline, these concern the identity of researchers ('psychology', 'age'), but their inclusion is not supported; it is left for the interviewer to interpret precisely how they might affect Scenario 1. Utterance [14] returns to the assertion in [1], implying that the assertion has been adequately supported in the intervening talk.

The characterisation in utterance [1] of the question 'Researchers' as 'complex' (and its reprise in [14]) recalls utterance 6 of Excerpt 51, in which the situation regarding 'suppliers' was described as 'complicated'. In both cases we are dealing with identity attribution, that is, who counts as a 'supplier' or a 'researcher' matters in the discourse, although not in a straightforward way. In Excerpt 51, the identity 'supplier' was problematic because it could be heard as applying to the speaker, and thus as undermining the legitimacy of his descriptions. To counter this, an alternative identity entitlement was worked up. In Excerpt 53, the identity 'researcher' does not carry this risk for the speaker. In this case the complexity is located in the disciplinary practices of different types of researchers, and so explains their interests in terms of information, although thereby rendering them discursively useless to support elements of the information chain. Thus, in Excerpt 53 the description of the question as 'complex' is probably best understood merely as "a bid for an extended turn at talk to elaborate the reasons" (Antaki and Horowitz 2000).

2.5 BLDSC employees on students' interests

Once again, Excerpt 54 follows directly on from Excerpt 53.

Excerpt 54 (relating to Scenario 1):

[1] Interviewee: Students, I think a similar reply to researchers, I would make.

[2] The anecdotal evidence I have is you get a minority of students,

again, who get everything, who want loads and loads of stuff, and others who couldn't care what they get as long as they get the exams.

[3] So you've got a pretty broad spectrum.

[4] Then again it depends what disciplines they are working in.

[5] And at what level, a post graduate student being very different to an undergraduate...

As perhaps indicated by the length of this excerpt, interviewees from BLDSC talked less of students than of others mentioned in Question 5 of the interview schedule. Excerpt 54 follows broadly the same pattern as that of Excerpt 53, with an initial distinction drawn between two groups of students (utterance [2]), this time based on their attitude to studying (rather than their discipline) and supported by anecdotal evidence (rather than 'research'). Once again, further variables (disciplines, post/undergraduate) are then introduced in utterances [4]-[5] without explicit support. Because it follows the same pattern so closely, this excerpt is probably best understood as further support for the points raised in Excerpt 53, with students' interests therefore being deployed as discursive backup to those of researchers.

3.0 Interviews with commercial organisations' employees

As noted in the introduction to this section on 'interests', according to ethnomethodological principles the fact that all of these organisations were 'commercial', that is profit-making, may or may not be relevant – that decision should be made case by case according to the orientation of the interview participants. That I have grouped them all here would appear to flout this principle. However, in general terms the participants in the interviews drawn on in the following sections did orient themselves to the for-profit nature of their organisations. Thus, despite these organisations being ostensibly disparate (publishers, database aggregators, document suppliers and so on), it was thought legitimate – as well as convenient – to group these interviews together.

However, the four hypothetical scenarios offered in the interview schedule were based on products marketed by several of the organisations whose employees were interviewed, and were recognised as such by most interviewees, including all who worked in commercial organisations. Thus, in terms of interest attribution, a distinction needs to be made in each case not just between self-interest attribution (generally to be avoided) and other-interest attribution (generally to be used discursively to disqualify or undermine others' roles in the information chain). The second distinction that needs to be made, and the one used to structure this section, relates to the scenario under discussion and whether it is oriented to by the speaker as representing a product marketed by their organisation. There is, clearly, another concern with avoiding self-interest attribution here, but there appeared also to be efforts by interviewees to configure others' interests in support of the appropriate scenario.

3.1 Commercial organisations' employees on their own products

At the time of the interviews, UMI was a company marketing a system similar to Scenario 1, and this is attended to in the following excerpt, 55.

Excerpt 55 (relating to Scenario 1, or 'System A'):

- [1] Interviewer: Yes OK.
- [2] Compared to journal subscriptions as a way of users getting stuff, who wins and who loses?
- [3] Interviewee: Well system A is the main approach that we have now.
- [4] We are having flat fee full text subscriptions.
- [5] I would have thought the library wins because of having the ability to provide something that they don't have to monitor costs like inter-library loans.
- [6] In the past where, within this universe of content they have

unlimited access, whereas traditionally many institutions operate a lot of bureaucratic labour-intensive ceilings on what could be retrieved free and after that who paid for what, and very labour-intensive.

[7] Quotas, yes, and users in some categories couldn't use inter-library loans etcetera.

[8] So it is a very positive thing that the library can announce it is going to have all this stuff which is going to help everybody from the lowliest undergraduate.

[9] So it is more democratic thing they're being able to present to their users internal and external, very often, systems like ours.

[10] You know it seems to me obviously that on the suppliers' side this has been adopted very widely as an option by people who, in the past, didn't think beyond bibliographic databases are now subscribing to full text, so clearly we are potentially a winner.

[11] And end users clearly are.

[12] The only thing charged for people like us and librarians is to control expectations, which have just rocketed in the last couple of years, and you have to put the message across that some things aren't available on the web within ten seconds.

[13] You just can't present them the way they expect.

[14] A lot of winners in that one.

[15] Interviewer: What about primary publishers?

[16] Interviewee: The opportunity for them is, in negotiation with UMI, to set up a contract where their information, aggregated in one of our systems, usually aggregated into journal databases, provide them with an extra revenue stream that they might not have had before.

[17] Interviewer: Do you think that they feel that there is an opportunity or a threat?

[18] Interviewee: I think that depends on the publisher.

[19] The evidence over the last year or two is where there are some publishers and they have their own critical mass of journals and

therefore they have got their own approach to selling on the web.
[20] But there are also quite a number who have been comfortable dating back many decades with UMI, where they are comfortable with the new formulas presented to them, where they have an opportunity to do something which they were not able to do on their own clearly because they are not aggregating and an additional stream to the print subscription and the web-based subscriptions which they have directly with their customers.

Utterance [1] closes a previous topic and in utterance [2] the interviewer reads out Question 5 from the interview schedule (which is, as noted above, available to both interviewer and interviewee throughout the interview). In [3] and [4], the interviewee explicitly equates System A with a UMI product and identifies himself with UMI by using the pronoun 'we'. Hence, the speaker has framed himself as an advocate of Scenario 1. While this might enable him to claim credit for his organisation where he can construct Scenario 1 as being in others' interests, it might constrain his efforts at so constructing because they must be now configured against a potential charge that his arguments are merely self-serving. So, how does the interviewee go about attributing appropriate interests to others while avoiding the charge of self-interest?

The speaker's first move is to hedge his statement concerning the interests of libraries in [5] ('I would have thought'); he has not worked up an entitlement to speak for libraries, and this hedge reflects this. The remainder of [5] seems to be in two parts, with the divide around 'something that', although it is not clear exactly where the divide is from this transcript. The first part of [5] is the start of an attribution of interests to the library, but this is interrupted by a statement relating to a particular current library service ('inter-library loans'). This divide continues in [6], where it is worked up into a contrastive pair ('in the past', 'traditionally' / 'within this universe'), the former being characterised negatively in terms of labour-intensive bureaucracy and, in [7], by its discriminatory impact on 'users in some categories'. This characterisation is then contrasted in utterances [8]-[9] with 'it' (that is, Scenario 1), which offers the opportunity for the

library to discursively construct itself ('announce', 'present') as 'democratic' and non-discriminatory. What has the speaker done in utterances [5]-[9]?

In terms of discourse, the speaker has characterised the library as an entity that is failing to be (that is, successfully to present itself as) both efficient and fair to its users. It therefore has an interest, indeed an obligation, in remedying this situation. In utterance [5] the speaker starts to attribute this interest to libraries, but stops because the attribution will not work until the appropriate context has been constructed. The majority of [5]-[7] is then concerned with constructing this context. For example, users' interests are invoked in [7] in support of this context construction and these interests are framed in terms of wanting access to library-mediated services rather than, for example, in terms of their disciplinary context, as in Excerpt 53. The interests of 'users' are being used here as a resource in the construction of the library's context (the information chain); an account of those interests in terms of 'researchers' or 'students' would be inappropriate for the information chain context, where these people are 'users'. Here we can see that context is constructed as required for the discursive purposes at hand. Once the library's context is defined, the speaker in [8] is able to return to the other side of the contrastive pair, describing it as 'very positive'. In utterance [9] the speaker refers back to the users' interests noted earlier and, invoking the technology-as-empowerment repertoire, describes 'systems like ours' as 'more democratic'. In terms of marketing, he has in utterances [5]-[9] constructed a problem for which he has the solution. This discursively local achievement has required the speaker to attribute specific interests to the library.

In utterance [10] the speaker addresses his own organisation's interests. As noted above, this is potentially a difficult topic, since there is a risk of the speaker undermining his legitimacy as an interviewee by appearing to be motivated by self-interest.

Consequently, utterance [10] is complex. The opening clause ('you know it seems to me') is an indexical and so explicitly acknowledges the place of the utterance in an interview wherein, as noted in [3]-[4], the speaker is acting as a spokesperson. However, the phrase 'it seems to me' constructs what follows as a version from 'I' the interviewee and, moreover, implies a slight category entitlement, that of the eyewitness. Thus, the

potential for self-interest is addressed right at the start of [10], but in a way that inoculates the following version against a challenge on that basis. In addition, the use of 'obviously' anticipates a claim and works as a general pre-empting of any challenge to that claim. In terms of anticipatory work, the final feature in [10] is 'on the suppliers' side', which constructs the speaker as speaking for /about 'suppliers' rather than the particular supplier referred to as 'we' in [3]-[4]. Hence, any interest is diluted throughout a group of actors and not focused on the organisation for whom the speaker is, according to [3]-[4], speaking. The speaker having carefully constructed a footing, at this point the subject and grammar apparently mark a shift to a claim about a state of the world wherein Scenario 1 ('this') has been chosen by people who previously wouldn't have. The discursive work done at the start of utterance [10] make this description hard to challenge on the basis of self-interest, but it is also structured as the result of actions independent of the speaker (actions of 'people') and for which therefore he does not have to account. The final clause of [10], which has been warranted by a description of a state in world, which itself has been legitimated by earlier discursive work, is an explicit acknowledgement that Scenario 1 is in the speaker's interests as spokesperson for his organisation. Hence, in utterance [10] we see how a description of the world is first justified, then structured appropriately, and finally used as the basis for an acknowledgement of self-interest that is hard to use as a challenge. In addition to the specific features of utterance [10], of course, previous utterances have set up Scenario 1 as positive and in the interests of people other than the speaker.

End-users are mentioned briefly in utterance [11], but their interests have already been invoked in previous utterances concerned with the library's interests (see above). Utterance [11] can be heard as referring back to these. At this point ([12]-[13]) the speaker recontextualises the previous assessments of Scenario 1 in an even more positive light by suggesting that it has the potential to create unrealistic expectations which have to be controlled. Thus, the technology-as-empowerment repertoire, used in [9] as a way to invoke users' interests in the construction of the library's interests, is described as too effective. The risk is not that the interests of users and libraries are not served by Scenario 1, but that they are served too well.

In response to what might be heard, despite all the interviewee's efforts, as an overly positive assessment of Scenario 1 in utterance [14], the interviewer in [15] challenges the interviewee by asking about the outcome for publishers. The interviewee has so far addressed each of the actors named in Question 5 of the interview schedule except publishers, and this is marked as potentially significant by the interviewer's interjection at [15]. At this point the interviewee adopts a different vocabulary, that of 'negotiations' and 'contracts', which might be termed a commercial repertoire. Note that this is the first point in the excerpt where the speaker's organisation, UMI, is named. The commercial repertoire was used in Excerpts 51 and 52 to work up organisational identities in the information chain. Here, in utterance [16], the interviewee invokes publishers' interests in a revenue stream to respond to the interviewer's implied challenge in [15]. However, this response is not accepted by the interviewer as adequate and, in utterance [17], the challenge is repeated using the commercial repertoire ('opportunity') adopted by the interviewee in [16]. In the ensuing utterances, the interviewee is faced with the task of addressing this challenge regarding publishers' interests without undermining the positive assessment he has already given of Scenario 1. His first move, in [18], is to disaggregate the category 'publisher', setting up a contrastive pair, justified by reference in [19] to 'evidence'. This pair seems at first to address the interviewee's two-part challenge ('opportunity or threat') as addressed in [18] by the interviewee. However, although the discursive structure answers the challenge, the content does not. Given the two-part structure of the challenge, we might expect the interviewee to respond to them in reverse order; this is what Schegloff (1997) terms the "canonical practice" in responding to turns that require two responses (Sacks 1987). Now, the first group of publishers in the contrastive pair are described as being independent of Scenario 1, 'they have got their own approach'. It is not clear that this group sees Scenario 1 as either an opportunity or a threat but, following the usual expectation of conversational practice, we might interpret [19] as the 'threat' part of the interviewee's response. This is immediately confirmed in utterance [20], in which the second group of publishers is described explicitly as having an 'opportunity' to work with UMI. They are also described as 'comfortable' and having an 'additional stream', emphasising strongly the positive side of the contrastive pair.

Thus, the interviewee has responded to a two-part challenge with a two-part answer, but has organised the content of this answer so as to avoid undermining the views he has expressed earlier and which were configured to support a positive assessment of Scenario 1.

In summary, there are many features of Excerpt 55 that point to the discursive work being undertaken by the interviewee in order that a positive assessment of Scenario 1 not be undermined either by a challenge to the speaker of self-interest or by the conflicting interests of other actors.

What I have termed the ‘commercial repertoire’ is used in Excerpt 55 to differentiate between talk concerning campus entities, such as users and libraries, and talk concerning information chain entities, such as UMI and publishers. This finding supports the grouping together of interviewees from what I have called ‘commercial organisations’, since the interviewees orient themselves to this commercial / campus distinction. However, since the interviewee from the BLDSC also made use of it, then we may conclude that there is support for including BLDSC as a commercial organisation for the purposes of this analysis.

3.2 Commercial organisations’ employees on other products

When discussing scenarios from the interview schedule that were not related to products marketed by the interviewee’s organisation, self-interest attribution was perhaps less of an issue, although it clearly remained as a possible grounds for challenging an interviewee’s account, because self-interest might motivate a negative assessment of such scenarios. In Excerpt 56 we can see, among other things, how a series of accounts were configured against such a potential challenge.

Excerpt 56 (relating to Scenario 2, or 'System B'):

- [1] Interviewer: Ok, so who wins and who loses in B, compared again with journal subscriptions as they are now?
- [2] Interviewee: I think there's a lot of losers there because, with a journal subscription on the shelf then the access is faster, you should just be able to pick it up and read it, so long as it's not being read by anybody else.
- [3] So I think you've lost in a number of ways.
- [4] You've lost in terms of convenience and immediate access.
- [5] The quality of the document won't be as high because it's going to be a photocopy so you'll lose things like colour.
- [6] Interviewer: Yeah
- [7] Interviewee: You could argue that you lose colour under system A as well, but you can have colour in the PDF so at least you can view it on screen.
- [8] Interviewer: Mmm
- [9] Interviewee: So I don't think system B is terribly attractive other than for peripheral material that probably was never taken on subscription in the first place.
- [10] Whereas system A might become a replacement for subscriptions, I think system B is always going to be complementary to subscriptions.
- [11] Interviewer: Right, and how do publishers feel about system B?
- [12] Interviewee: Well, I think the challenge for us really, as I was saying earlier, is to market those services that do provide payment back to publishers.
- [13] I mean, system B, fair-dealing, there's nothing that we can do about it so we might as well accept it, but look at =
- [14] Interviewer: = providing an enhanced service that might be preferable
- [15] Interviewee: Yes, so I mean competing with it by providing online document delivery which is going to be faster, more efficient, and provides a

better quality document.

[16] And if we could get the price down to something that was close to the British Library document supply price then we ought to be able to compete on price as well.

[17] Interviewer: Yes

[18] Interviewee: And some of the infrastructure costs of handling bits of paper within the university fall out of the equation.

Once again, the excerpt begins with an explicit reading by the interviewer of Question 5 from the interview schedule. The interviewee's initial response posits many losers in Scenario 2, going on to support this claim by comparisons, initially with journal subscriptions. At this point in utterance [2], the speaker shifts from the plural ('losers') to the singular ('you' – arguably singular with reference to [3] and [5]) in a description of how journal subscriptions are better than System B. Of course, journal subscriptions are currently the main business of a publisher, so that we might expect this stance; the question is how is it achieved without self-interest appearing to be the main motivator in the description? Firstly, the interviewee describes the comparison in terms of a singular actor who we may infer represents a researcher or a student – someone who picks up and reads journals. Here, again, the interests of the user are invoked to support or criticise a particular scenario, so that it is not that the interviewee necessarily has anything against System B, merely that it is not in users' interests. Secondly, the speaker notes that 'you should just be able...'; what work is 'should' doing? 'Should' is a usefully ambiguous word, in that it can imply obligation (in the sense of 'ought') and it can imply 'in theory' (in the sense of 'if I have put the batteries in right, this thing should work now').

Although the sense in utterance [2] is mainly the latter (given the last clause of [2]), the implication in the first part of [2] that journal subscriptions are already being favourably assessed means that the obligation sense is also available at this point. This emphasises the legitimacy of users' interests and so strengthens the favourable assessment of journal subscriptions.

Utterance [3] reflects the shift to a singular actor noted above, for rather than there being 'a lot of losers', there is now one loser (the user) who has lost in a number of ways. To account for this claim, utterance [3] can be heard as anticipating a list of the ways in which 'you' have lost. Canonically, and as noted on several occasions discussed above, this list would have three elements in it. The first two elements are given as expected, and the interviewer's interjection at [6] can be heard as a prompt for the final element. However, it is not forthcoming. Instead, the grounds of the comparison are shifted, and this has important consequences for the rest of the excerpt. In utterance [7], the interviewee compares System B, not with journal subscriptions, but with System A. Initially he notes a similarity between the two, but then he claims there to be a significant difference, and again these assessments are made in relation to 'you', the user. At this point the interviewee has invoked a number of users' interests (convenience, immediate access, viewing colour on screen) to rank System B below both journal subscriptions and System A.

The implicit connection between journal subscriptions and System A, that has been set up by similarly positive assessments of them compared with System B, is confirmed in utterance [10]. At the mention of subscriptions in [9]-[10], the interviewer in [11] attempts to orient the interview directly to publishers' interests. Immediately, and as discussed in relation to Excerpt 55 above, the commercial repertoire ('challenge', 'market', 'payment') is used in utterance [12] as soon as the interviewee's organisation is mentioned. The phrase in [12] 'payment back to publishers' is the only explicit stating of publishers' interests, and occurs at the end of an utterance constructing the information chain using the commercial repertoire. The discredited System B is then set up as the first part of a contrastive pair, the second part of which is, interestingly, supplied by the interviewer in [14]. There are many possible interpretations of utterance [14], but at this point it is perhaps best heard simply as a prompt for the interviewee to explain the contrastive pair. A secondary interpretation is offered below.

The remainder of the excerpt is concerned with the interviewee discursively constructing an alternative to System B that is owned by publishers. System B, having been

discredited earlier in the excerpt, is available as a standard against which this alternative can be positively assessed. This is done using a three-part list in utterance [15] that invokes users' interests as constructed in [2]-[5], and by invoking the interests of the university (explicitly in utterance [18]).

We can see, then, that the interviewee assesses systems and scenarios by invoking the interests of others, mainly users. These interests generally need first to be appropriately constructed, as in utterances [2]-[5]. However, in utterances [16] and [18] the interviewee seems to assume a shared understanding with the interviewer through which the interests of the university can be inferred. Grounds for this assumption are given by the interviewer in [17] and, especially, in utterance [14], where the interviewer displays sufficient shared understanding with the interviewee to enable him to complete a contrastive pair. However they are constructed, whether predominantly by one speaker or interactively using shared tacit understandings, interests are again shown in Excerpt 56 to be deployed to support local discursive achievements. Whereas in much discourse analytic literature, interest attribution has been understood as a means of working up or undermining entitlements and descriptions (Potter 1996, Antaki and Horowitz 2000), in these interviews it is used to work up or undermine the accounts from the scenarios offered by the interview schedule and participants.

Interests: concluding remarks

Interest attribution has been found to be widespread in the interviews. The excerpts analysed above are not untypical of the transcripts as a whole, and they show interest attribution as a very common and effective discursive device for legitimating and undermining the hypothetical scenarios in the interview schedule. Furthermore, it was common to find interviewees' accounts configured against potential charges of self-interest. That is, their accounts invoked the interests of others in their support. The bottom line in this respect seemed to be users' interests. Users, or end-users, could be described as what researchers and students become when their interests are configured to

support or undermine propositions relating to the information chain. The value of these interests appeared to rely on their legitimacy being outside the scope (and therefore the accountability) of the interviewees. In their discursive construction of this scope, both technological and commercial repertoires were common, suggesting that these categories were discursively constitutive of the information chain. This can be thought of as boundary management, since users' interests (that is, scholarly communication) could then be defined as those practices of researchers that were not commercial or technological. We can see, then, that an idea of the disinterested scholar is a direct corollary of an idea of the interested (that is, commercial, competitive) information chain. Further levels of detail were visible in the transcripts, for example in splitting the information chain into commercial and campus sectors, and these might be regarded as supplementary devices in the management of interests.

However, these local achievements both relied on wider knowledge and used wider lexical repertoires than would be comprehensible from an analysis that was limited to the excerpt sequences alone. All of the interviewees could be considered to be 'interested' in the conventional sociological sense that they were all interviewed because they worked for certain organisations that might be expected to have a stake in the various scenarios in the interview schedule. This is not the discursive sense of 'interest' that is the focus of the above analyses, and yet it is relevant. Cicourel (1992) has noted how shared tacit understandings, such as that displayed at the end of Excerpt 56, inform what we, as researchers, report as the 'context'. Cicourel is arguing against the ethnomethodological position that the relevant context is only that which participants demonstrably orient to. Those without specialised knowledge of the information world might not understand what stake the interviewees' organisations had, and why, therefore, we can interpret certain discursive moves in certain ways; indeed how we can interpret certain events as discursive moves at all. Thus, there are occasions that I have catalogued above where interviewees have invoked the interests of others to support certain versions and to undermine others and where interviewees have deflected attention from their own self-interest, which might undermine their account. None of these interests would be comprehensible as interests without a basic, tacit, 'insider's' understanding of the

structure of the information chain. Indeed, the whole research project relies on such an understanding in order that topics be formulated, relevant organisations and interviewees selected and inferences be available from data. This is what Cicourel (1992) has called the broad context, and it is necessary so that interest management techniques can be recognised as such. That is not to say that such a context is not oriented to by participants, nor that such orientations do not mandate us considering them as contexts, but it is to say that such orientations would not necessarily be understood as orientations without some knowledge of the broad context.

Interviews with information professionals: summary and conclusions

The discourse analytic study of the information chain revealed a number of practices and repertoires deployed in the interviews that served as data for the study. In terms of deixis and subjectivity, we saw how interviewees used 'I' to construct themselves as precisely that, as interviewees who were accountable in that role. 'We' was used to indicate accountability elsewhere, most notably as a spokesperson for an organisation. In terms of interests, we saw how users' interests were invoked widely to support accounts and to deflect attention from possible challenges on the grounds that the speaker her/himself had an interest in the account being put forward. The interests of content (that is, scholarly texts), also played this legitimating role in the talk of a publisher.

Other particular discursive practices that were used to manage accounts included:

- show concessions (Antaki and Horowitz 2000);
- three-part lists (Atkinson 1984);
- contrastives (Potter 1996);
- disaggregation or splitting of problematic categories;
- use of ambiguity, most notably 'you', but also 'should' (Sacks 1992a).

These practices were used to produce rhetorical effects that were recognised as such in the interviews. They can be understood as the fine-grain practices of speakers in an interview who are rendering accounts. However, the additional accountability of speakers outside the interview (sometimes signalled by 'we') meant that they were rendering accounts for some purpose(s). Before I address this issue, it is necessary to review speakers' use of repertoires, which can be understood as the coarse-grain practices in rendering accounts.

In terms of repertoires, the category of technology seemed to be available both to support an account, by being aligned with users' interests, and to undermine an account, by automating roles. The former repertoire I have called 'empowerment', since it tended to include such terms as 'access' and 'availability'. The latter repertoire I have called

'automation', and was principally used to challenge the role of an actor other than the speaker¹⁶. The two repertoires seemed to act like an adjacency pair, in that the use of one made the other also relevant. If the speaker used only one of the two, then s/he used another repertoire to block the relevance of the other. For example, use of the empowerment repertoire to invoke users' interests might be followed, not by the automation repertoire, but by an account (that used a financial lexicon) of the irrelevance of automation. In certain cases this was extensive enough to justify being called a commercial repertoire.

The interests of users were not unproblematically available to speakers; they had to be discursively configured to be consequential for the information chain while maintaining the legitimacy of scholarly communication. For example, as 'researchers' and 'students', users' interests could be supported by reference to their identities either within a discipline or on campus. However, within the information chain, the relevant identity was 'end-users'. Converting 'researchers' into 'end-users' was a necessary step in enrolling their interests in the support of a particular account. The difference between 'researchers' and 'end-users' was not the only way in which the information chain was distinguished from other arenas. A commercial lexical repertoire (negotiations, contracts, deals) was used by non-campus-based speakers at least partially to differentiate between information chain and campus-based practices. In these constructions of the information chain, we are beginning to see, if not a 'form of life', then a discrete set of discursive practices and entities that is defined against other such sets.

In the above I have noted that speakers used certain practices and resources to render particular accounts in the interviews, to support these accounts and to undermine others. Is it possible to infer, from the patterns of this accounting, what it was for? That is, accounts were offered in the interviews that had features other than those that were solely analysable in terms of their presence as accounts in an interview. Did these features

16. What I have called the 'technology-as-empowerment' repertoire is clearly related to technological utopianism (Shields 1995, Streeter 1997). The 'automation repertoire', on the other hand, has strong links to dystopian technological determinism.

amount to anything interesting? I argue that they did and, furthermore, that without an understanding of this context it is not possible to make much sense of what went on in the interviews.

One set of lexical features that has not yet been mentioned is that which seemed to constitute the information chain as a competitive space. This is explicit at several points in the interviews, and serves to contrast two types of practice or actor. One type of practice or actor is discursively supported, for example by reference to users' interests or by using the commercial repertoire or by deploying a politeness regime. The second type of practice or actor, without such support, is left as naked and self-interested and thus is discursively undermined. Obviously, speakers usually align themselves with the former. When this picture is allied to the other characterisations of the information chain, noted above, we have a fairly detailed context by reference to which we can analyse the accounting in the interviews. This context is that of a competitive discourse, wherein repertoires such as technology and commerce, interests such as those of end-users, and subject positions such as spokesperson, all combine in a coherent system of meanings. Discursively, the tactics in play in the interviews can only be understood in relation to a strategy in this context, which was to use the meanings available within the competitive discourse to render accounts that configured the occasion as an interview and the participants as stable actors. For the interviewees, for the most part, their stability (the reason they were being interviewed) relied on the organisation in which they worked, so that their strategy was to offer accounts that supported that organisation. The competitive discourse is thus both a cause and a result of the discursive practices in the interviews. This type of somewhat difficult conclusion is inevitable if one takes seriously both the ethnomethodological position, that the relevant context for any social event is that to which the participants orient themselves (Schegloff 1997), and a wider understanding of context (Cicourel 1992).

Chapter Nine: Summary and discussion of substantive topics

Introduction

Three substantive topics were introduced in Chapter One and formed the basis for the analyses presented in Chapters Five to Eight. These were formal scholarly communication, the academic information chain (as a social or economic entity) and machinic technology. The aim of this chapter is to outline the main findings of Chapters Five to Eight as they relate to these topics, to suggest points of contact between these findings and other current work in the area, and to propose future directions for substantive work.

Chapters Five to Eight offered two methodologies by which data analyses could proceed, and no attempt has yet been made to synthesise the results from them. No such attempt is made in this chapter either, since the whole question of the compatibility or otherwise of the outcomes of discourse and co-word analyses is addressed in Chapter Ten. To allow for this split, this chapter details firstly the findings of each methodology as a whole, and then the findings as they relate to the boundaries between the substantive topics.

Findings from the two methodologies

Social constructionist discourse analysis

The constructionist discourse analyses in Chapters Six and Eight sought to assess relevant boundary management work in the interviews by focusing on personal deixis (self-reference) and interest management. It was found that academic researchers responding to questions that implied a degree of technological determinism, rarely challenged this perspective. Instead, they used this notion of technology in their accounts, together with those of formal scholarly communication and the information chain. They used formal

scholarly communication to support a category entitlement for them to speak as researchers. That is, in order to maintain their identity as a researcher in the interviews, researchers invoked activities relating to such matters as reading and writing articles. In answering particular questions, they often marked these matters off (as 'research') from other activities that could be automated. Typically, these other activities defined the information chain, although explicit reference to information chain entities was generally limited to the library. Formal scholarly communication and technology-as-automation, then, structured parts of these interviews, regulating what researchers could claim as 'their' work. It is not possible to infer whether either of these was a residual category, defined in terms of the other; it is more likely that the boundary was a matter of ongoing negotiation relating to the local interactional business of the interview. Academic researchers also used the category of technology in the interviews to claim a degree of empowerment, and this could be understood as the payoff from not challenging the technological determinism in the interview questions, once the potential threat to their researcher subject position had been dealt with.

The rhetorical split of technology into two related repertoires, of automation and empowerment, was perhaps even clearer in the interviews involving information professionals. These interviews showed that the two technology repertoires could be treated as analogous to an 'adjacency pair' in conversation analysis; that is, when one was used, the other was expectable, and was either invoked directly or addressed using, for example, a financial lexicon to account for its absence. As in the interviews with academic researchers, this discursive activity appeared to be related to the protection of the subject position of the interviewee. However, whereas researchers could do this by mapping the two technology repertoires onto the information chain (automation) and scholarly communication (empowerment), this tactic was unavailable to information professionals, whose work was very much related to the information chain. The tactic could not simply be reversed, either, since the interests of academic researchers (appropriately configured as 'end-users') were a necessary resource for these people in legitimating their roles. Hence, they drew different boundaries. Librarians would apply the automation repertoire to document suppliers, publishers would apply it to libraries,

and so on. This was both a description and a demonstration of the information chain as a competitive space.

In summary, the discursive activities in two sets of interviews, with academic researchers and with information professionals, seemed consistently to make use of a familiar set of resources. These included dual repertoires of technology, as automation and empowerment, a notion of formal scholarly communication to which these technology repertoires were not applicable, and a highly contested idea of the information chain, wherein both technology and interviewees seemed to be fighting for a role. It should be remembered that, although these resources appeared to be generally available, their use was occasioned; they were used to do interactional business at the local level in the interview.

Actor-network co-word analysis

The actor-network perspective was operationalised in Chapters Five and Seven by co-word analyses of the same two sets of interviews as analysed using discourse analysis. The categories of formal scholarly communication, the academic information chain and machinic technology were each represented by a set of 20 words, and these were located in the co-word networks developed from the interview corpora. The boundary regions between the three categories were identified across various subcorpora. From these analyses, it appeared that academic researchers in most benchmarking interviews linked a well-defined cluster representing scholarly communication to 'Library', which was defined as a part of the information chain, and was its main representative in the interviews with researchers. These networks were relatively punctuated; that is, they were concentrated with many internal links. This library model was dominant in most benchmarking interviews but was challenged in some evaluation interviews (concerning electronic document access systems) by models based on 'Document' and 'Paper'. The evaluation interviews were also less punctuated than the benchmarking interviews. Technology words never formed central clusters in the same way as did scholarly

communication words, although they were perhaps more central in the 'Document' and 'Paper' models than in the 'Library' model. The boundary regions between the categories varied, although the information chain was mainly represented by 'Library' so that it rarely formed a recognisable cluster. The boundary between scholarly communication and technology often included 'Access', 'Photocopies' and 'Screen-Read-Print', which suggests that that boundary was concerned with researchers' access to their own private copies of documents (see below)¹⁷.

Technology can be introduced into the analysis of the interviews with researchers other than as a category of words. The difference between the benchmarking and the evaluation interviews was their topic, that is, the benchmarking interviews were concerned with current practice whereas the evaluation interviews were concerned with practices relating to a new electronic system. Therefore, it could be argued that this topical difference was technological and that differences between the two sets of interviews related to this introduction of technology. The principal such difference was in the punctuation of the actor-networks; they were generally less punctuated in the diagrams representing the evaluation interviews. This would imply that one effect of the introduction of technology is to disrupt existing networks, making certain identifiable links weaker, notably those to 'Library'. Whether this is a temporary or a permanent effect is unclear.

Whereas 'Library' and 'Document' appeared to be alternative network centres in the interviews with researchers, they were consistently linked in the interviews with information professionals, together with 'User' (information chain) and 'System' (technology). This, then, was the main boundary region between the three categories in these interviews. Indeed, because of the paucity of scholarly communication and technology words in these interviews, 'Library-Document-User-System' must be considered the only unambiguous boundary region. Unfortunately, this corresponds closely to the interview schedule, and should probably be considered as an artefact of the

17. The patterns described varied according to the subject area being considered; the reader is referred to Chapter Five for further details.

interview. More insight is perhaps available by noting the links to key words from the three categories in interviews with librarians, with managers at BLDSC, and with those working in commercial organisations, as shown in Table 9 in Chapter Seven. Although illustrative rather than conclusive, this suggested that shifts in the use of ‘Electronic’ and ‘Journal’ were important at the topical boundaries in many of these interviews.

In terms of actor-network theory, the analyses in Chapters Five and Seven give a precise mapping of the actants that constitute the interview-talk of a number of groups of people, including researchers, librarians and publishers. The categories of scholarly communication, the information chain and technology were defined as topics *a priori* and, in general, did not correspond closely to these actants. Nevertheless, in order to sustain the topical focus of the research, attempts were made to identify boundary regions between the three categories.

Boundaries between the substantive topics

In this section I summarise the findings as they relate to the boundaries between the topics of scholarly communication, the information chain and technology. Each of these sets of findings is divided according to the methodology from which they derived. As noted above, the question of synthesis is addressed in Chapter Ten.

Meadows (1998) has noted that “Research information in printed form has been available for many years, but an examination of the physical products - especially scholarly journals and books - shows that their appearance has changed considerably with time... [T]echnical changes have often been a less important factor in such changes than the evolving needs of the research community.” (1998 p1). This is a common view of the boundaries between scholarly communication (the ‘evolving needs’), the information chain (the ‘physical products’) and technology (‘technical changes’). That is, both scholarly and technological imperatives influence the information chain, but technological ones perhaps less so. This view derives from what was called in Chapter

One 'classical sociology', wherein sociological competence excludes the technological and the scientific. One purpose of the analyses in Chapters Five to Eight has been to see whether this view or others was apparent in interviews with academic researchers and information chain professionals.

The boundary between scholarly communication and technology

Co-word analysis

Overall, researchers defined the boundary region between scholarly communication and technology to be a region concerned with transforming networked access to material into readable documents via the processes of photocopying, downloading and printing. These words can be glossed as methods of obtaining privately owned, paper copies of documents. There were variations within the interview corpus, and these were detailed in Chapter Five in terms of the subject area relevant to the researcher and whether the interview was a benchmarking or an evaluation interview. For example, the boundary region for business researchers between scholarly communication and technology was somewhat ill-defined because the category of technology was rather scattered around a core of scholarly communication words. On the other hand, that for manufacturing engineering researchers was perhaps equally ill-defined, but this time because the category of scholarly communication was rather scattered around a number of technology clusters. Moving from the benchmarking interviews to the evaluation interviews we can see an increase in the importance of 'access' in the boundary between scholarly communication and technology.

The networks representing the interviews with information professionals showed little significant boundary region between scholarly communication and technology, since both categories were more related to the information chain than they were to each other. However, 'electronic-journal' was one consistent connection between the categories.

All of the above findings are consistent with the classical sociological view of the information chain as that which is affected by technology and scholarly imperatives.

Although causality is not represented in the networks, the boundary between the latter two categories was found to be in terms of the former. This was explicit in the interviews with information professionals. In the interviews with researchers, an even more extreme version of this process seemed to be in evidence, where the information chain was reduced to access, downloading and printing. This is similar to the view put forward by Henderson (1999), wherein the impact of web technology is to reduce the information chain to a simple Source - Access / Storage - User model.

Discourse analysis

Academic researchers constructed themselves as such in the interviews partly by contrasting what they did as researchers with what was achieved using technology. The latter was often used by researchers to define the information chain as an 'other'. Policing a boundary between that which could be automated and that which was genuine research or scholarship was a way for researchers in interviews to maintain their category entitlement to speak as researchers in the interviews. This boundary management work could get very involved, since it could imply that the roles of others (for example, academics writing literature reviews, or information professionals) were both susceptible to a degree of automation and - relatedly - as not legitimate as genuine research or professional activity. The advantage for researchers in pursuing this determinist view of technology was that it could be understood as 'empowering' research, that is for example, as enabling researchers to be up-to-date or as facilitating the natural rhythm of research via instant access to documents. In this role, technology was dependent on scholarly communication, so that technology was only described as effective where scholarly communication was independently relevant. Thus, in the interviews with researchers, technology appeared as twin repertoires, automation and empowerment, as a part of boundary management work wherein scholarly communication was contrasted with the information chain. An alternative to 'technology' in this role was 'time', and Chapter Six refers to an 'economy of time', which again served to differentiate scholarly research and communication from automatable information chain activities. Technological

determinism (the view that technology can be described as if it had agency) was, therefore, a significant discursive resource in the interviews with researchers, and was not challenged when it framed an interview question.

Information professionals barely touched on the boundary between scholarly communication and technology, except to associate the technological empowering of end-users with their own role in the information chain. As noted below, it was this boundary (between scholarly communication and the information chain) that was more central to the interviews with information professionals.

The boundary between scholarly communication and the information chain

Co-word analysis

Taking the interviews with researchers as a whole, the information chain was represented mainly by 'libraries', so that the boundary region between it and scholarly communication consisted essentially of 'journal', which linked directly to 'libraries'. This was the constant and only link throughout all of the cuts through the data explored in Chapter Five, although it was supplemented by 'book' and 'article' in some corpora. However, because the centrality of 'libraries' declined from interviews with business researchers to those with manufacturing engineering researchers, and from benchmarking to evaluation interviews, so the centrality of the link between it and 'journal' also became more peripheral to the main network. The concurrent rise in the centrality of the scholarly communication word 'document' was not accompanied by an associated link to an information chain word. Taking this trend together with the increasing importance of 'access' between scholarly communication and technology, noted above, supports a widespread view that there is an increasing tendency to discuss such matters in terms of just-in-time document access rather than just-in-case library holdings (Morris and Davies 1999).

'Library' was also a central information chain word in the interviews with information professionals, although in this case it was part of a larger cluster that included 'publisher', 'supplier' and 'user'. However, 'journal' and 'document' also comprised the (distinct) links between this cluster and scholarly communication, as they did in interviews with researchers. The implicit characterisation here is of producers (publishers, libraries) and products (journals, documents) that vary with technology, and consumers (users) that do not. Once again, the information chain is described as sets of dependent entities, rather than as entities with independent legitimacy and agency.

Discourse analysis

In many ways, the role of the information chain with regard to scholarly communication in the interviews with researchers was associated with that of technology, as discussed above. The information chain was related to automatable activities as seen by researchers who, perhaps, expressed a position similar to that of Henderson (1999), noted above. This 'conduit metaphor' for information has been common in information science (Day 2000), and frames issues of communication as questions of coding and, hence, as automatable in principle. Of course, one advantage for researchers adopting this position in interviews was that they shifted the burden of accountability for the problematic consequences of automation to the information chain and, hence, beyond what they could reasonably be expected to answer for in the interviews. Researchers used a number of devices, such as the ambiguous 'you', to manage this positioning of accountability such that their utterances could not easily be heard as naming specific entities (especially university libraries) as particularly susceptible to automation. The result of these moves was to protect the interviewees' membership of the category 'researcher', together with the entitlements that went with it. It can be argued from the analyses of the interviews with researchers that this imperative was behind much of the discursive work therein.

For information professionals, researchers could be configured as 'end-users' in the information chain. If successfully configured, their interests became available as

resources for information professionals in the interviews to legitimate their roles within the information chain. Similarly, the artefacts of scholarly communication, for example journals, could be configured by publishers as 'content', thus rendering it as a legitimate and necessary contribution by publishers to the information chain. This striving to legitimate roles suggested that the information chain was being seen and used in the interviews as a competitive space wherein actors needed external resources to sustain a viable (discursive) position. Of course, this relates closely to common realist perceptions of the information chain (Jones 1999, Waaijers 1999), wherein a number of actors are attempting to sustain a viable (realist, for example economic) position. In the case of the interviews with academic librarians, this process was occasionally twofold, so that researchers¹⁸ were configured as 'end-users' in terms of the information chain, and as something like 'stakeholders' in terms of the local university campus, with its associated struggles for legitimacy and money. Finally, just as the interests of end-users could be used to legitimate the roles of some actors in the information chain, so they could equally be used to undermine the roles of others.

All of the functions of the information chain as a discursive entity discussed above have it as a space that is constructed by forces external to it, be they technological or scholarly. Again, then, the latter two factors are black-boxed and independent whereas the information chain is social in the weak sense of being distinct from and yet subject to factors that do not themselves need explanation.

The boundary between the information chain and technology

Co-word analysis

Given the fragmented character of the category of technology, and the predominant focus of the information chain category on 'library', the interviews with researchers offered little that was easily identified as a boundary region between these two categories. A

18. Of course, I have configured them as 'researchers' for the discursive purposes of this

common link between 'library' and 'system' probably related more to the ambiguity of the latter than to any meaningful boundary region.

Most of the interviews with information professionals were represented by diagrams in which the boundary between the information chain and technology was focused on 'library' and 'electronic'. This was true of the interviews overall, of those with academic librarians and (although less so) of those with BLDSC managers. The only exception was the complex diagram representing interviews with those working in the commercial sector, Figure 143, in which no clear pattern was apparent (although 'database' perhaps identified an important region).

The lack of a clear boundary suggests that these two categories may not be clearly separated in the interviews, which would be consistent with what has been said above.

Discourse analysis

As might be expected from the discussions above, the discursive boundary between technology and the information chain was hardly an issue for researchers in the interviews. Indeed, the two were often conflated or posited as (at least in principle) interchangeable.

Information professionals negotiated this boundary with somewhat greater attention, often in ways that were analogous to researchers negotiating the boundary between scholarly communication and technology (see above). That is, the twin repertoires of technology enabled interviewees to protect their own discursive positions as information professionals (librarians, publishers and so on) and to undermine those of others.

Technology as empowerment related to end-users - it was they who were empowered - and acted as one way to enrol the interests of end-users in the legitimation of a particular discursive position. Where the local interactional demands of the interview required that

thesis; there can be no wholly unmotivated description.

interviewees were concerned with technological 'effects' on a single entity, such as a library, then devices such as the ambiguous 'you' were used to allow for interpretative slippage (or 'politeness') between the two technology repertoires. Alternatively, a financial lexicon was used to account for the absence of the automation repertoire at particular points in the interaction. Another way technology was used was to bracket off the 'technical' as a category for which interviewees were not accountable and, therefore, to emphasise their professional identities rather than the routine (automatable) aspects of their role.

Once again, these analytic findings support the contention that both scholarly communication and technology were outside the legitimate accountability of the interviewees, and were resources for them because they were unaccountable. That is, the classical, realist sociological view, wherein independent factors explain dependent ones, was maintained by the interviewees, with scholarly and technological matters being independent, or matters that require no further legitimation within the context of the current account.

Implications

To what extent do the findings reported above confirm or dispute the sociological realist conception of the information chain as determined by relatively independent realms of scholarly and technological imperatives? It would appear that, despite the tide of academic opinion reported in Chapter One criticising sociological realism, it is precisely that perspective that informs the views of both academic researchers and information professionals. Furthermore, the same perspective is apparent in the professional literature. For example, in advocating the development of e-print archives as an alternative to traditional journals, Van de Sompel and Lagoze note that "the current implementation of peer review - an essential feature of scholarly communication - is too rigid and sometimes acts to suppress new ideas... The e-print archives exemplify a more equitable and efficient model for disseminating research results. An important challenge

is to increase the impact of the e-print archives by layering on top of them services - such as peer review - deemed essential to scholarly communication.” (Van de Sompel and Lagoze 2000). Here we see the information chain being merely the outcome of technological developments (the new e-print archives) and scholarly imperatives (peer review).

Both academic researchers and information professionals used sociological realism (including both scholarly and technological determinism) in the interviews, and this is in contrast to strong theoretical criticisms of that perspective. Should we then conclude that the interviewees were blind to the theoretical problems of their perspective? This stance would be unsustainable, given that the methodological stance of this project is epistemologically relativist, that is, concerned with the structure and effectiveness of accounts rather than their truth. What, then, should we make of the discrepancy? I would argue that the answer to this question concerns the ethnomethodological concept of indexicality.

All social or linguistic behaviour is indexical, that is, it is occasioned by and in, and is constitutive of and is elaborated by, the local circumstances in play at the time. Furthermore, as Garfinkel and Sacks note, “ ‘indexical’ features are not particular to laymen’s accounts. They are familiar in the accounts of professionals as well.” (Garfinkel and Sacks 1986 p160). The unavoidable implication is that, because the local circumstances of the interviews and of the analyses are systematically different, we should not be surprised to find different accounting techniques in use. In its deployment of boundaries (for example, between the scholarly, the social and the technological) a realist account offers resources to interviewees that would be unavailable to them if they adopted a relativist stance. (This deployment has been the topic of Chapters Five to Eight.) On the other hand, the topicalisation of such boundaries themselves, as in this chapter, cannot easily be achieved within a realist account.

The implications of this for research on scholarly communication, the information chain and technology are profound, since such research cannot easily proceed using realist

accounting methods. Studies of the 'impact' of technology (Day et al, 1993; Costa and Meadows, 2000; McKnight et al, 2000), or the of 'needs' of researchers (Wissenburg 1999; Porter 1998), rely on an implicit characterisation of the information chain as dependent on scholarly and technological matters. This characterisation is a members' rather than an analysts' device, and so should be the topic for study rather than a resource used in explanations. That is, rather than using the ideas of scholarly communication or technology as ways to explain how it is that certain configurations, such as 'the information chain', come about, researchers need to examine how it is that such ideas are deployed to achieve such an effect on certain occasions. This examination will inevitably be reflexive.

If, for a moment, we characterise reflexivity as recursive topicalisation (a characterisation that is discussed in Chapter Ten), then this chapter has consisted of a first reflexive turn in relation to the topics of scholarly communication, the information chain and technology. A second reflexive turn would concern the theoretical and methodological approaches used in the analyses, and so Chapter Ten moves the ground further and considers whether the results from the co-word and the discourse analyses can be synthesised.

Chapter Ten: Synthesis?

Introduction

I have hinted on several occasions, notably in Chapters One and Nine, that the conventional format of this thesis might be questioned at some point. I have postponed such questioning until this chapter for reasons that should become apparent. However, I shall postpone it a little longer, to allow for a brief recapitulation of what has gone before as if it had been a research project of a more conventional form (which it may have been).

Recapitulation (1)

In various ways, three of the four theoretical positions noted in Chapter One have informed the progress of the thesis as a report of a research project. The view of classical sociology has been set up as an ‘other’, like technological determinism (with which it is not incompatible), against which the research has been configured. That is, in enforcing a boundary between the social and the technical, classical sociology seemed to mark off technical systems as outside possible sociological analysis, but at the same time seemed to leave the way open for studies of the ‘impact’ of technology on social and organisational structures and processes. This position has been criticised from both social constructionist and actor-network perspectives, each of which has been operationalised as empirical methodology. In this thesis, these empirical methodologies are represented respectively by discourse analysis and co-word analysis, each of which has focused, among and via other things, on the boundaries in a set of interviews between the topics given in Chapter One, machinic technology, the academic information chain (as a social or economic entity) and formal scholarly communication. Both discourse and co-word methodologies include a strong bias toward induction, that is, toward looking to the data for topics, rather than allowing the analyst to define topics *a priori*. Because of the formal demands of this thesis, both methodologies have been somewhat adapted so as

to allow for the research to be presented in a conventional way, as an investigation into particular phenomena (where those phenomena can be assumed to exist prior to investigation). Summaries of the results from Chapters Five to Eight were offered in this spirit in Chapter Nine, organised both by methodology and by topic. The reader is referred to these summaries as a starting point for this chapter. In particular, this chapter is concerned with whether the two sets of results can legitimately be combined.

Combining the analyses? (1)

So far, I have followed a realist convention in research accounts by being fairly rigorous in my distinctions between theory, analytic methodology and data. Theory was dealt with in Chapter One, analytic methodology in Chapters Two and Three and data in Chapter Four. However, the obvious questions to ask at this point concern the relationship (if any) between the results from the discourse and the co-word analyses, as given in Chapters Five to Eight and summarised in Chapter Nine. Are the analytic findings alternatives, as suggested in Chapter One? Can they be synthesised? Do they stand independently? What is the epistemological status of each? These questions blur the distinctions drawn between theory, analysis and data, and so disrupt the realist research account. That is, the first piece of ‘ontological gerrymandering’ (Woolgar and Pawluch 1985) in Chapter One established two principal theoretical approaches (social constructionism and actor-network theory) as alternative explanatory resources. It also fixed, that is operationalised, the topics as scholarly communication, the information chain and technology, and thus enabled analyses of a set of relevant data to proceed. In contrast, at this point, the topics are fixed as the theory, analytic methodologies and data described in Chapters One to Four. Boundary work has gone into keeping these separate and so sustaining the thesis in a realist and empirical style, and this work has been more than merely dividing the thesis into appropriately named chapters.

The question is, is it possible to investigate Chapters One to Four in such a way as to demonstrate the compatibility or otherwise of social constructionism (discourse analysis)

and actor-network theory (co-word analysis)? (Note that Chapters One to Four are now seen as data.) The appropriate explanatory resources for such an undertaking would be those whose success or otherwise would demonstrate the (in)compatibility of social constructionism and actor-network theory in this thesis. The obvious candidates as such explanatory resources are those approaches themselves. That is, epistemological compatibility might be best assessed by mutual investigations of and by each approach. Therefore, discourse and co-word analyses were undertaken of sections of Chapters One to Four (as they stand in this document) that concerned social constructionism / discourse analysis, and of sections that concerned ANT / co-word analysis. The foci of each of the resulting four analyses were the boundaries between 'theory', 'analytic methodology' and 'data'. A comparison of the results of these two reflexive analyses should suggest whether the boundaries between theory, analytic methodology and data are compatible across the two approaches.

By theory in this thesis, I mean references to sociological / theoretical perspectives such as actor-network theory and social constructionist approaches such as SSK, as well as issues of realism, relativism and reflexivity. By analysis, I mean references to methodological issues concerning qualitative empirical or analytic work such as conversation, discourse and co-word analyses. By data, I mean references to the interview corpus, consisting of material such as texts, transcripts, words, accounts or practices (depending on the analytic stance taken), all associated with participants. These definitions, like those of scholarly communication and so on in Chapter One, were generated from an initial study of the data (in this case, Chapters One to Four) in which the most common references to theory, analysis and data were noted. They were used to generate the categorical definitions necessary for a co-word analysis of those chapters, and to sensitise the discourse analyst to the possible relevance of the topics at particular points in the text.

Discourse analyses

There is a difficulty in principle in using discourse analysis to investigate monologic text, and that is that there is no interaction by which to warrant an interpretation of the data. That is, the analyst cannot point to a demonstration of understanding in the interaction as support for any particular analytic assertion, because there is no interaction. However, we are not necessarily left merely with the analyst's interpretation. Wooffitt (1992) has argued that extended excerpts of monologic text can be susceptible to conversation analytic procedures inasmuch as they are built progressively, with subsequent sentences making use of the local context created by previous sentences. Although extending the scope of the analysis beyond conversation analytic boundaries, this is the basic stance adopted here.

Discourse analysis of ANT in Chapters One to Four

The excerpts analysed here were selected to illustrate the boundary management work undertaken throughout the relevant (ANT / co-word) sections of Chapters One, Three and Four. However, like the excerpts analysed in Chapters Six and Eight, they are not to be understood as a sample taken from a population. The general status of the practices described is not claimed on the basis of statistical validity but on the basis that they are concerned with recognisable and familiar realist accounting methods.

The following excerpt is taken from Chapter One. It has been reformatted to aid navigation and analysis, but the reader is advised to refer to the original in case of query.

Excerpt 57 (from page 33):

Heading: Actor-Network Theory

Sentence 1: The Actor-Network Theory, or ANT, is most associated with work undertaken at the Ecole des Mines de Paris by Bruno Latour and Michel Callon, and with the work of John Law.

Sentence 2: It emerged in the 1980s between scientometrics and science and technology studies.

Sentence 3: The approach itself is highly variable in form, and probably cannot legitimately be called a 'theory'.

Sentence 4: Indeed, labelling the approach at all is problematic; Latour has noted that "there are four things that do not work with actor-network theory; the word actor, the word network, the word theory and the hyphen!" (Latour 1999).

Sentence 5: However, it is an approach that has been highly influential in recent social theory, especially that concerned with science, technology and power.

This excerpt is anticipated by the heading 'Actor-Network Theory', and comes in a sequence of sections that have described theories such as the sociology of scientific knowledge (SSK). Sentences 1 and 2 maintain this impression, linking the 'theory' with apparently legitimate academics and disciplines. However, in Sentence 3 this realist account encounters trouble; the theory is not a theory. The quote that reinforces this trouble, in Sentence 4, seems bizarre in that it appears to be self-undermining. This would seem at first glance to be an example of what was discussed earlier in Chapter One, concerning the self-undermining nature of radically relativist accounts. This quote has been introduced, though, into a realist account that is apparently seeking to construct ANT as a legitimate academic canon, and it is in this light that the identity of the quote's author, Latour, is significant. That is, as someone already named as a pioneer of the approach, and associated with a prestigious academic institution, Latour cannot easily be read as either a critical or a flippant commentator on the actor-network approach. This anticipates the repair of the realist account in Sentence 5, wherein the legitimacy of ANT is backed up by reference to its consequences (its 'influence in recent social theory')

rather than to the conditions of its constitution. Topicalising the consequences of a proposition, rather than its constitution, is what Latour elsewhere (1987) calls a 'positive modality', and it works to inoculate an account against challenge. Even at this early point in the thesis, then, ANT appears to disrupt realist research accounts and, as a result, its status as 'theory' is questionable.

In Chapter Three, the questionable theory of ANT finds itself brought further into a realist account of research, in which its relation to analysis is at issue:

Excerpt 58 (from page 80):

Sentence 1: Working within the actor-network approach tends to require the analyst to reject *a priori* distinctions.

Sentence 2: Indeed, one of its notable early successes was in persuading some analysts of the problems in maintaining an analytical distinction between the social and the technical.

Sentence 3: The actor-network approach is to be engaged with that which is being analysed and to seek distinctions from there.

Sentence 4: It is, in a word, inductive.

Sentence 5: (It is also several other things, such as reflexive and elusive.)

Sentence 6: Of course, no realisable analytic approach is wholly inductive, or wholly deductive, and methodological styles such as the experiment, ethnographic participant observation and interview-based qualitative work all configure the dialectic slightly differently.

Sentence 7: As we shall see, there are various points in a co-word analysis at which theory may be introduced.

A characterisation is offered in Sentence 1 of the actor-network approach, taken here to refer to theory or, at least, to something standing for theory. This characterisation has ANT determining what counts as analysis, and evidence is provided in Sentence 2 that this characterisation is precedented. However, note that despite being called 'actor-

network theory' in Chapter One and elsewhere (Law and Hassard 1999), it is here referred to as an 'approach'. Again, ANT's problematic status as theory is an issue. The word 'theory' avoided in Sentences 1 and 3 to allow the actor-network entity to shift positions and become, in Sentence 3, associated with data. Data is highly legitimate within realist accounts where it is 'evidence', or that which legitimates analytic claims. Hence, if a realist reading is sustained, the association of 'actor-network' with 'that which is being analysed' affords legitimacy to the actor-network approach at the expense of its status as theory (that is, as something to which reference would be made in making *a priori* distinctions, or deduction). Its status as something that might stand for theory, though, is addressed in Sentence 4, with its characterisation as 'inductive'. Sentence 5 anticipates the problematic status of induction for conventional realist research accounting (wherein data legitimates theory via analysis); 'elusive' is not usually a preferred epithet for something standing as theory. The extended treatment of this problem in Sentences 6-7 reserves both 'approach' and 'theory' for entities that are not the actor-network, which has shifted again to become an ideal (not 'realisable'), or one side of a dialectic. A rhetorically strong three-part list (Atkinson 1984) of recognisable approaches is offered as evidence that analysis must lie between ideals. The prefix to Sentence 6, 'Of course', works as an appeal to a dialogic conception of common sense (Billig 1996), wherein any maxim can and should be counterposed with an apparently contradictory one if it is to appear reasonable, that is, if it is to have the legitimacy of a 'common-place'. Thus, the legitimate, inductive, data-oriented actor-network is counterposed in Sentence 7 with points at which 'theory may be introduced'.

The above description of Excerpt 58 allows us to see how the boundaries between actor-network theory, analysis and data are highly problematic within realist research accounting conventions. This is explicit in Sentence 6, in which these conventions appear as that which is 'realisable'. The realist requirement for an announced topic for research places specific restrictions on what kind of entity can stand as theory, restrictions with which the actor-network approach cannot easily comply. As a result, it appears in the account as a shifting and unstable entity, first as a determinant of analysis, then as associated with data, and finally as an unrealisable ideal.

Discourse analysis of social constructionism in Chapters One to Four

In contrast to the problematic opening to the description of ANT, discussed above, social constructionism is introduced in Chapter One with little apparent disruption to realist accounting conventions.

Excerpt 59 (from page 14):

Heading: Sociology of Scientific Knowledge

Subheading: Introduction

Sentence 1: The history of the sociology of scientific knowledge (SSK) as generally told goes as follows (Woolgar and Ashmore 1988).

Sentence 2: SSK was configured as a reaction to the approach known as the sociology of science, wherein the reward structures and social norms and contexts of scientists were studied, but the content of science itself, the knowledge, was unexamined.

Sentence 3: It was assumed that, because the scientists were the experts, only they could comment on scientific knowledge.

Sentence 4: The critique of this view, which became known as SSK, was enabled by the influence of relativism (see below) on social science, following Kuhn (1970).

Sentence 5: Bloor's 'strong programme' (1976) was highly influential in this critique, introducing the notion of symmetry in explanation.

Sentence 6: In this case, the symmetry was between 'true' and 'false' beliefs; the role of the sociologist was to use the same types of explanation for how each came to be believed at certain times and in certain places.

Sentence 7: Bloor's programme was operationalised by Collins (1981), who described a three-stage Empirical Programme of Relativism, which was to become highly influential in the emergence of SCOT (see below), but which, as it was published, related specifically to the conduct and resolution of scientific controversy.

This sequence makes use of a familiar narrative structure specific to realism, that of progress, wherein there is a necessary disturbance to situation, which results in the reinstatement of that situation in a revised and improved form. The familiarity of the form is anticipated in Sentence 1 by the use of the word 'history' and the phrase 'generally told'. The old order is described in Sentences 2 and 3, the disturbance ('critique') in Sentences 4 and 5, and the reinstatement ('role of the sociologist', 'operationalised') in Sentences 6 and 7. That is, at no time in this introductory paragraph are the boundaries between theory, analysis and data questioned. The only boundary in question is that defining what constitutes valid data for sociological analysis and theory. Although analysis and theory are revised as a result, their integrity is not challenged. Is there any evidence of discursive work undertaken to sustain this smooth history?

The following excerpt is from Chapter Two:

Excerpt 60 (from page 66):

Sentence 1: The relativising effects of this kind of work can be seen in another important paper, McKinlay and Potter (1987), in which a conference debate between two groups of psychologists is analysed.

Sentence 2: The debate is between the advocates of two understandings of scientific practice, a 'top-down' understanding in which small hypotheses generated from large theories are tested, and a 'bottom-up' understanding in which the testing of small hypotheses leads to the generation of large theory.

Sentence 3: Again, the empiricist and contingent repertoires are discovered in the psychologists' discourse.

Sentence 4: The subject matter (psychology research) gives a clue as to the reflexive potential of analysing the discursive features of academic accounts, a matter that is not taken further here (Ashmore 1989, and see Chapter Ten).

The immediate context for Sentence 1 is a discussion of Gilbert and Mulkay's (1984) use of discourse analysis to investigate scientists' accounts. A more distant, but relevant,

context is the discussion of relativism in Chapter One. There are at least two features of this excerpt that might alert us to the presence of analysable discursive work. Firstly, the excerpt as a whole uses precisely the 'empirical repertoire' that is one of its subjects. Secondly, and as hinted in Sentence 4, McKinlay and Potter's (1987) article, being a replication of Gilbert and Mulkay's (1984) study (see Sentence 3), is testing the hypothesis that scientists use different repertoires. Hence, it is committed to one side in the psychologists' debate. The excerpt is presented as part of a realist research account (that is Chapters One to Nine), that part being the literature review, whose purpose is to position this thesis in a stable and legitimate academic canon. As such, it too is committed both to a 'top-down', deductive model of research and to using the empirical repertoire. However, this is only sustainable if we adopt Collins' (1998) highly problematic position, as discussed in Chapter One, wherein this account would be isolated from its own analytic approach. It is noticeable that the trouble comes to a head in Sentence 4, wherein the theory-analysis boundary is at issue. Given the deep disruption evident in Excerpt 60 to the smooth flow of the realist research account, we might wonder how Excerpt 59 accomplished such an apparently seamless history. Quite simply, and as attempted in Excerpt 60, the implications of a relativist stance are bracketed off from Excerpt 59 (as 'reflexivity'), enabling the production of a locally realist account.

Summary of the discourse analyses

Both ANT and social constructionism can be shown to be deeply problematic for realist research accounting wherein the boundaries between theory, analysis and data have to be maintained. However, whereas ANT seemed to reconfigure itself tactically so as to appear unstable, social constructionism seemed to bracket off a set of inferences as logically valid but practically impermissible in order to conform to the realist conventions.

Co-word analyses

The reflexive co-word analyses proceeded in exactly the same way as that described in Chapters Five and Seven, and the reader is referred to those chapters and Chapter Three for details of the methodology and presentation.

The three topical categories were represented by the following words (with associated variants):

Theory: actor-network, ANT, social, construction, sociology, theory, SSK, realism, relativism, reflexive.

Analysis: analysis, analyst, co-word, conversation, discourse, qualitative, empirical, method, methodology.

Data: data, corpus, interview, text, word, practice, account, material, transcript, participant.

Co-word analysis of ANT in Chapters One to Four

The corpus analysed here consists of the relevant sections of Chapters One and Four, together with the whole of Chapter Three. The final list of prompt words is shown in Appendix D; they were selected from those words occurring five or more times in the corpus, so as to keep the analysis within the scope of the available software. The speech turn was the unit of proximity used in the analysis of interview data in Chapters Five and Seven; the paragraph is the equivalent unit in the following analysis. That is, a pair of prompt words occurring in the same paragraph constituted one countable co-word relation.

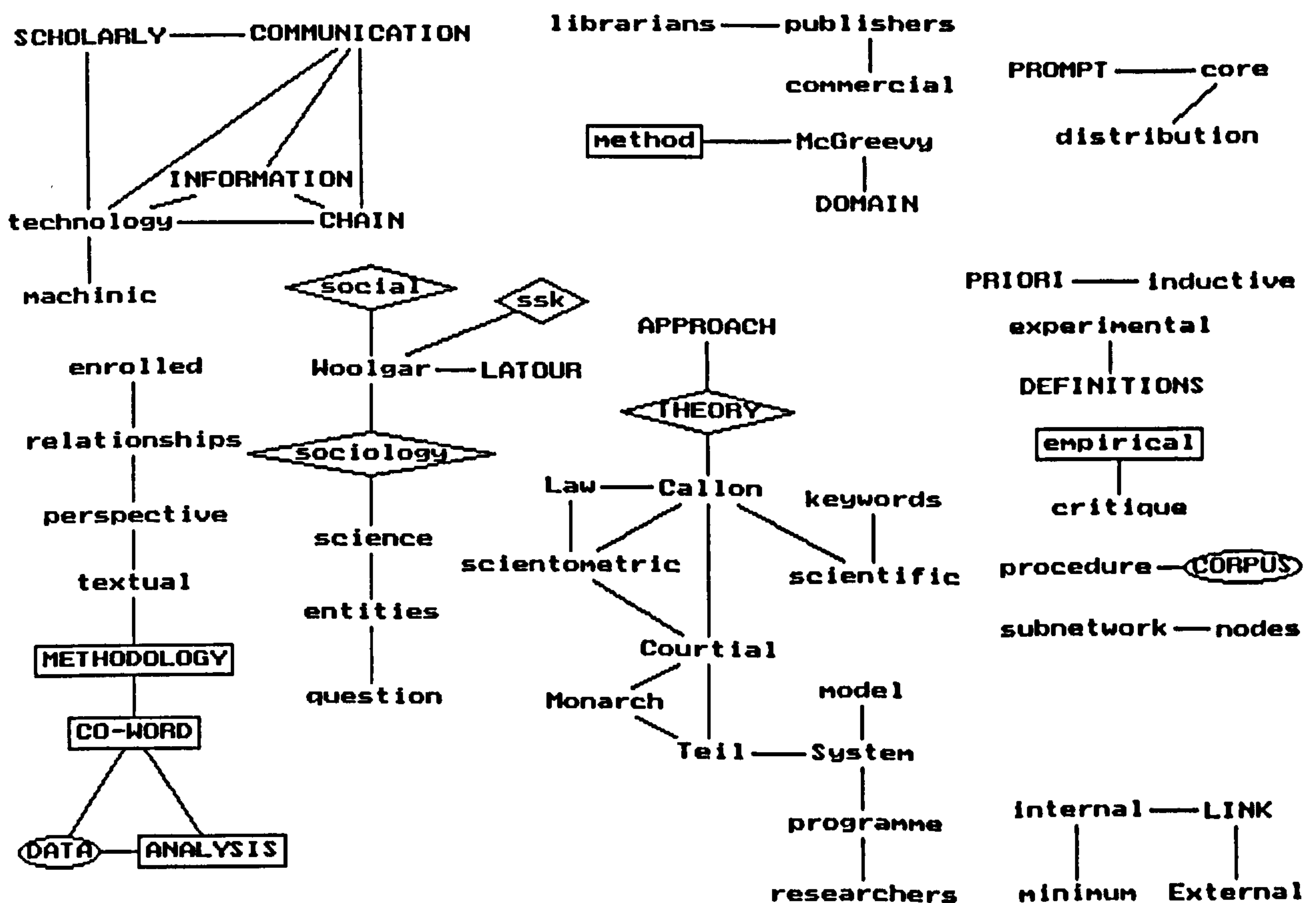
The core of words used most frequently, as estimated from a Bradford-like frequency distribution, was:

WORDS, ANALYSIS, CO-WORD, ANT, CORPUS, NETWORK, DATA, INTERVIEW, LEXIMAPPE, TEXT, APPROACH, CATEGORY, LINK, DIAGRAM,

DOMAIN, SCHOLARLY, INFORMATION, LATOUR, THEORY, METHODOLOGY, DEFINITIONS, STUDY, ACADEMIC, COMMUNICATION, INCLUSION, REPRESENTATION, CHAIN, PRIORI, PROMPT.

A global association diagram for this corpus is shown in Figure 144, at a threshold value of S of 0.15 (the minimum required to produce a legible diagram). Words defined above as representing 'data' are shown in ellipses, those representing 'analysis' are shown in boxes, and those representing 'theory' in diamonds.

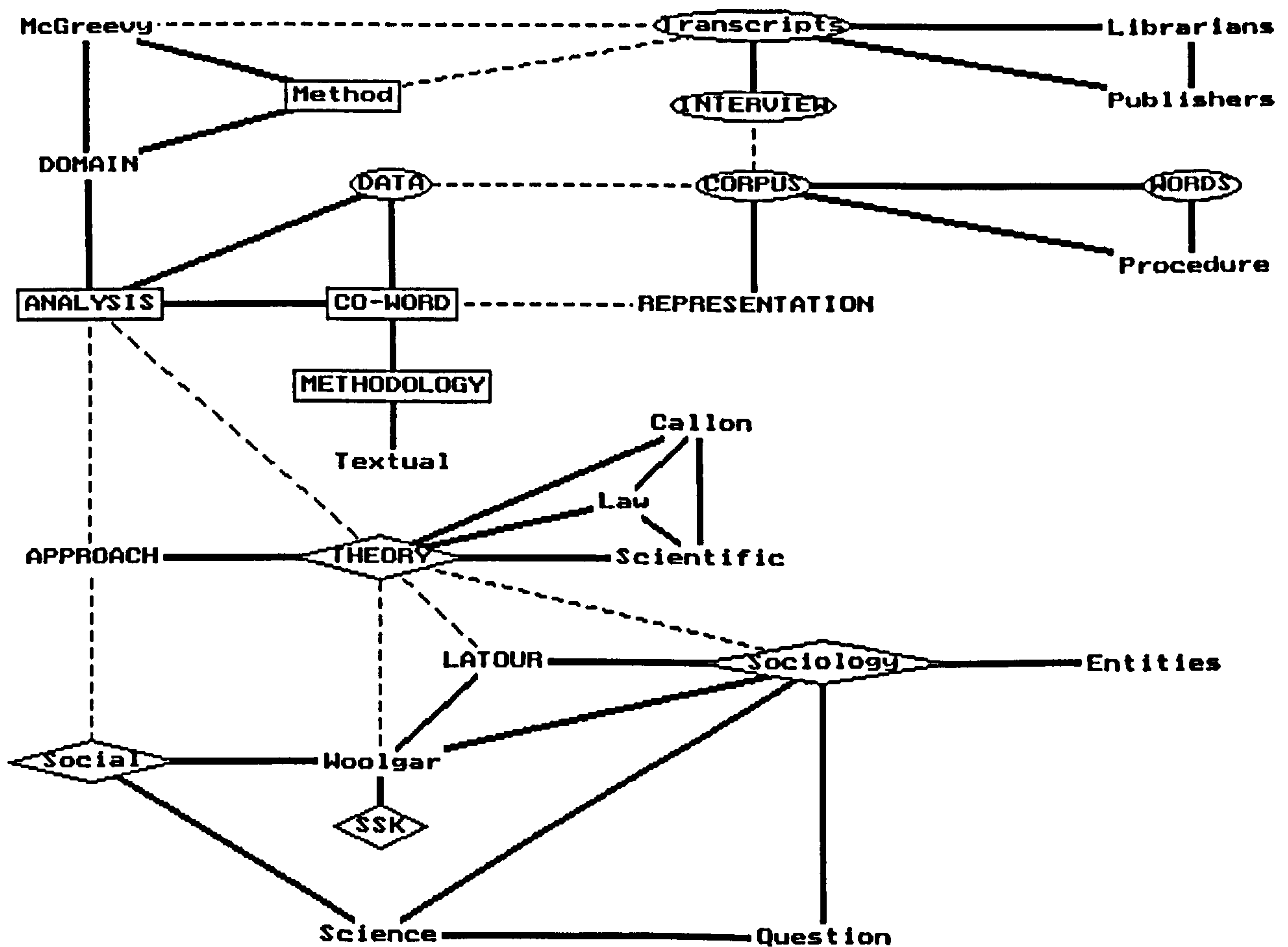
Figure 144: Global association diagram for the ANT / Co-word sections of Chapters One, Three and Four



Several features are grossly apparent from this diagram. Firstly, the cluster at the top-left clearly represents the categorical definitions of scholarly communication, the information chain and technology that were used in the co-word analysis. Three other major clusters are visible, one around {Co-word-Methodology}, one around 'Woolgar' and one around

'Callon'. The last two are the names of authors, and it is not surprising to find these associated with theory and with other authors such as 'Latour', 'Law' and 'Courtial'. In general, it appears that the three categories (theory, analysis and data) are well separated, except for {Co-word-Data-Analysis}. However, for a clearer view, leximappes were constructed and, from them, a synthesis diagram (Figure 145) was generated covering the category words found there.

Figure 145: Synthesis diagram showing theory, analysis and data words in the ANT / Co-word sections of Chapters One, Three and Four



The proposition put forward above, that {Co-word-Data-Analysis} is the major point of contact between any of the three categories, is borne out by the synthesis diagram. It shows that the three categories are otherwise relatively separate, although there are a number of external links between the data and the analysis clusters. The analysis cluster lies between those of data and of theory. However, it is notable that 'ANT' does not

make an appearance either in the global association diagram or in the category synthesis diagram. This would seem surprising, given that the sections of text selected for analysis were those specifically concerned with ANT and co-word analysis.

Co-word analysis of social constructionism in Chapters One to Four

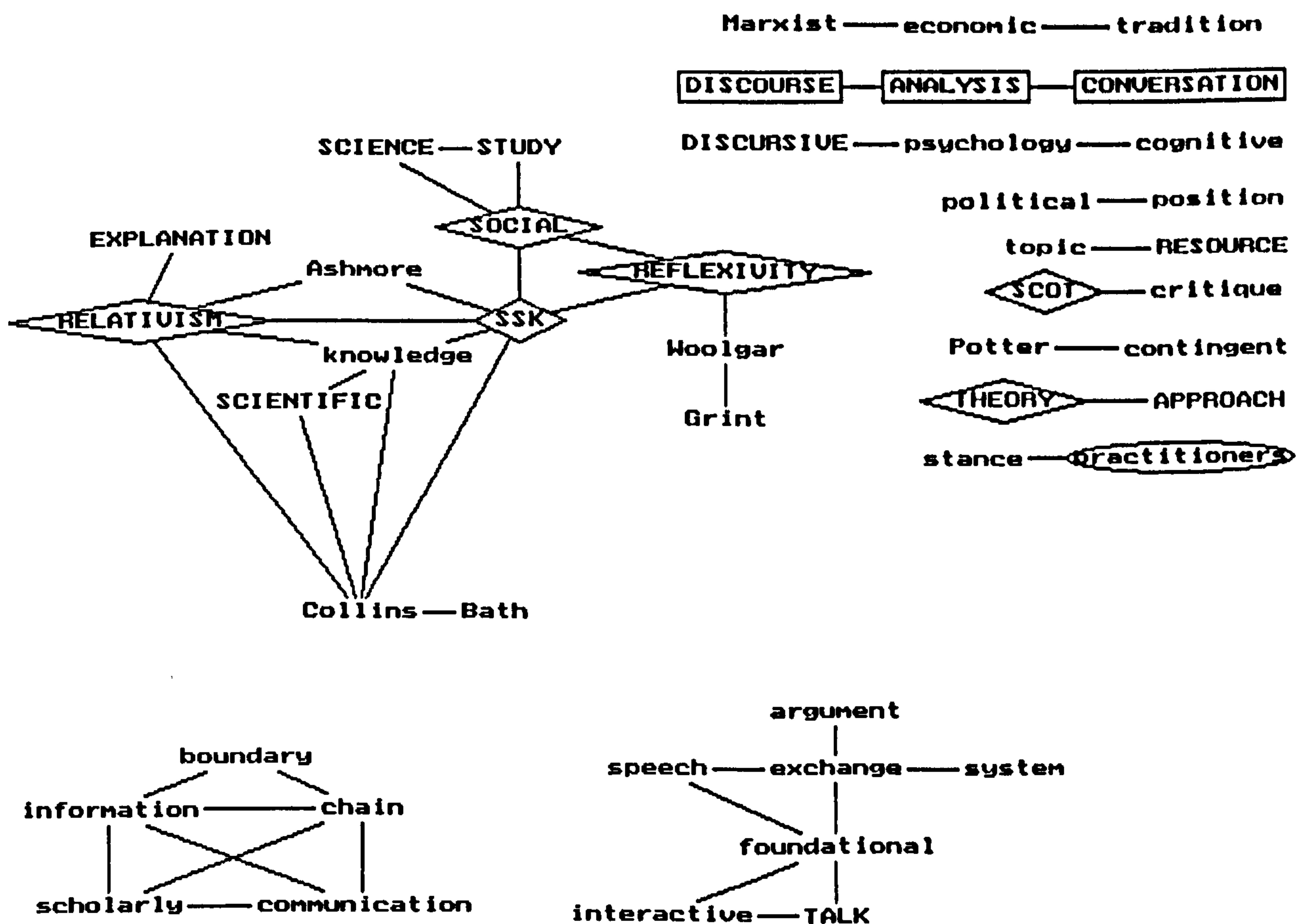
The corpus analysed here consists of the relevant sections of Chapters One and Four, together with the whole of Chapter Two. The final list of prompt words is shown in Appendix E; they were selected from those words occurring eight or more times in the corpus, so as to keep the analysis within the scope of the available software. Again, the paragraph is the unit of proximity in the following analysis. That is, a pair of prompt words occurring in the same paragraph constituted one countable co-word relation.

The core of words used most frequently, as estimated from a Bradford-like frequency distribution, was:

ANALYSIS, SOCIAL, DISCOURSE, PRACTICE, APPROACH, STUDY, THEORY, CONVERSATION, ACCOUNT, INTERACTION, SSK, ACADEMIC, SCIENCE, QUESTION, DISCURSIVE, CLAIM, SOCIOLOGY, TECHNOLOGY, ANALYTIC, LANGUAGE, REFLEXIVITY, RESEARCH, ETHNOMETHODOLOGY, INTEREST, STRUCTURE, DATA, EMPIRICAL, ISSUE, ANALYSTS, RELATIVISM, RESOURCE, CA (CONVERSATION ANALYSIS), SCIENTIFIC, TALK, EXPLANATION, INTERVIEW.

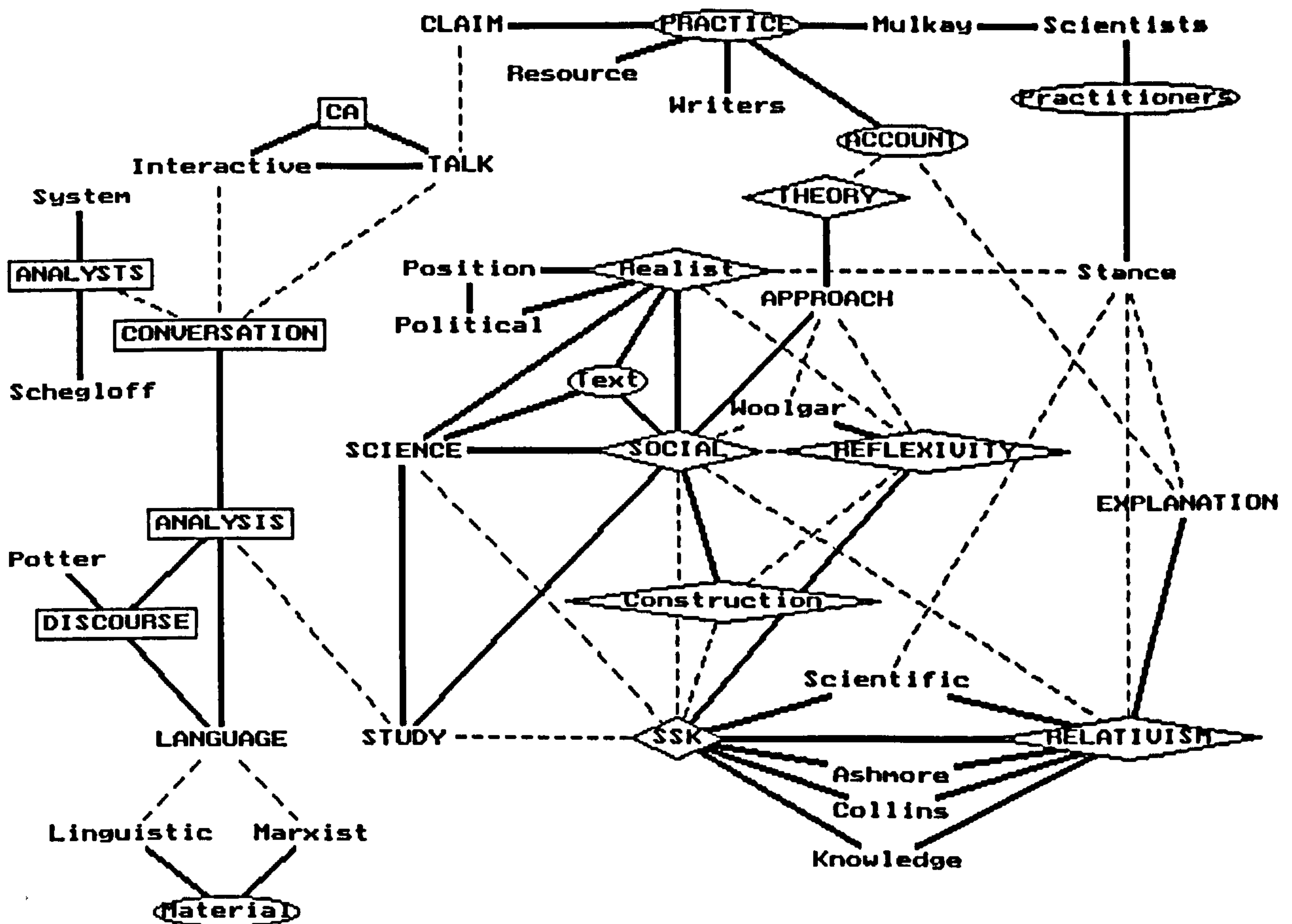
A global association diagram for this corpus is shown in Figure 146, at a threshold value of S of 0.28 (the minimum required to produce a legible diagram). Words defined above as representing 'data' are shown in ellipses, those representing 'analysis' are shown in boxes, and those representing 'theory' in diamonds.

Figure 146: Global association diagram for the social constructionism / discourse analysis sections of Chapters One, Two and Four



As in Figure 144, a cluster is visible representing the categorical definitions of scholarly communication, the information chain and technology (at the bottom-left). However, the main network is centred on 'Relativism' and 'SSK' and includes 'Reflexivity' and 'Collins'. Theory words are common throughout this network, where they are linked to authors (Woolgar, Grint, Ashmore, Collins). Theory is also apparent in two dyads, {SCOT-Critique} (SCOT refers to the 'social construction of technology' - see Chapter One) and {Theory-Approach}. Analysis words are confined to the somewhat definitional cluster {Conversation-Discourse-Analysis} (the techniques of conversation analysis and discourse analysis are discussed in Chapter Two). The only data word in the diagram is 'Practitioners' (a variant of 'Practice'). Again, for a clearer view of the relations between the words representing theory, analysis and data, a synthesis diagram was generated from a leximappe series, and is shown in Figure 147.

Figure 147: Synthesis diagram showing theory, analysis and data words in the social constructionism / discourse analysis sections of Chapters One, Two and Four



In contrast to the absence of 'ANT' from Figure 145, 'social construction' is prominent in Figure 147, lying at the centre of a cluster of theory words at the bottom right of the diagram. Most of the relatively few data words lie in the cluster at the top right, which is only loosely linked to the main theory-dominated subnetwork. Loose linkage also characterises the relation between the cluster of analysis words to the left of the diagram and both the data and theory clusters. In summary, then, the co-word analysis shows the three categories, theory, analysis and data, well separated in the parts of this thesis concerned with social constructionism and discourse analysis.

Summary of the co-word analyses

Generally, the results of the co-word analysis indicate that the first four chapters of this thesis conformed closely to the realist accounting convention wherein theory, analysis and data are maintained as discrete entities. This is true both of the sections concerning ANT and those concerning social constructionism. There were differences between these two corpora, though, the main one being the complete absence of any explicit representation of 'ANT' as a term linked to theory, analysis or data, whereas social constructionism was clearly central to theory.

Recapitulation (2)

It may be as well quickly to recapitulate what is being attempted. Chapters Five to Eight of this thesis have offered apparently empirical findings relating to how boundaries were or were not maintained, in sets of interviews, between the concepts of formal scholarly communication, the academic information chain and machinic technology. These findings achieved their apparently empirical status (to the extent that they did) by reference to two theoretical approaches, together with their associated analytic methodologies, and also with reference to realist conventions relating to how such theory, analysis and data should be associated. The question then arose as to whether the results of the two sets of findings could be combined. That is, were their epistemological statuses compatible? To the extent that the epistemological status of knowledge is related to the procedures used to generate it (think, for example, of the difference between science and superstition), then these procedures were relevant to this question. It has been suggested that one important aspect of these procedures is the realist convention in research accounts that theory, analysis and data are distinct entities that stand in particular relations to each other (and are so defined). Hence, the question of the compatibility of the findings from the co-word and the discourse analyses turns on the way in which each of these, as presented in this thesis, conforms to this realist convention. Addressing this issue has involved a reflexive detour in which the topic has been precisely how ANT and

social constructionism have been presented in this thesis. The findings from this reflexive detour are, broadly, that although both ANT and social constructionism do operate to an extent within the realist convention wherein theory, analysis and data are strictly separated, they do so differently. ANT appears to trouble realist accounts, being variously associated with theory, analysis and data, depending on the local contingencies of the text. It is therefore not firmly associated with any of the three categories, and this is reflected in the fact that it does not appear at all in the co-word synthesis diagram. In contrast, social constructionism stands more clearly in the position of theory in the realist structure. However, it achieves this by bracketing off certain logically problematic issues as 'reflexivity'.

At least three (mutually related) questions arise at this point:

1. How do the above considerations inform a decision on the relationship between the findings from the discourse analytic and the co-word analytic research presented in Chapters Five to Eight?
2. What is the basis for the difference between ANT and a social constructionist approach as they appear in a realist research account such as Chapters One to Eight?
3. To what extent is this thesis aligned with either an ANT or a social constructionist approach to research accounting and reflexivity?

These questions are addressed in the following sections.

Combining the analysis? (2)

The question of the compatibility of the findings in Chapters Five to Eight can now, finally, be addressed. The co-word analyses derive from ANT, and ANT is in this realist thesis (Chapters One to Four) an unstable entity. Its slippery quality when forced into realist research accounts, associating with theory, analysis and data, is termed by Latour (1988) 'infra-reflexivity' (see Chapter One), whose aim is to achieve locally persuasive, realist effects by tactically collapsing *a priori* conceptual boundaries. That is, the epistemological status of the outcomes of a research procedure informed by ANT - such

as co-word analysis - is relativist and post-modern. The only available status for knowledge (both that claimed by researchers and that granted to those being researched) is local, tactical and contingent. In contrast, social constructionism stands in the place of theory in this thesis, but in doing so is divided between realism and reflexive relativism. Locally realist accounts are produced, not by tactical moves, but by the strategic bracketing off of something called 'reflexivity'^{19,20}, which is corrosive to realist accounts. As a result, the outcomes of a research procedure informed by social constructionism are deeply ambiguous in terms of their epistemological status. The conclusion must be that the findings of the co-word analysis and those of the discourse analysis are not compatible and that it would make no sense to try to synthesise them.

However, the conclusion reached above is based on the findings of the reflexive detour. In this, both co-word and discourse analyses were used, and the results combined, to develop an inference from Chapters One to Four on the epistemological statuses of knowledge derived from those approaches. There would seem to be a problem in concluding on the basis of such a combined approach that such combinations are illegitimate. It would perhaps have been more useful to have adopted a different (third) approach to assess the epistemological statuses of the outcomes from co-word and discourse analysis. However, the outcomes of such a third approach would be open to a challenge that they were committed to one side or the other, with no way of assessing the challenge other than by recourse to a further (fourth) approach. And so on. Such an account of reflexivity as debilitating, as a problem to be bracketed off, surely positions this thesis as social constructionist, a position that is reinforced by a consideration of this chapter as precisely the kind of bracketing off of reflexivity described above. So, is this thesis, like the analysis by McKinlay and Potter (1987) noted above, committed to one side in a debate it is ostensibly analysing? This question relates to how topics are

19. It is this strategic move that enables some writers to characterise reflexivity as a dangerous 'other' in academic inquiry, see (Pollner 1991) for a critique of this position with respect to conversation analysis.

20. One question being addressed in this chapter is whether this thesis has bracketed off questions of reflexivity - to this chapter - and what consequences there might be. See below.

configured in the research process, because it casts reflexivity as recursive topicalisation, first of a named topic, then of the account of that topic in a text, then of the commentary on the account, and so on.

Configuring the topics

Technology, the information chain and scholarly communication were given conventional definitions in Chapter One. The purpose of these definitions was to allow those three concepts to be topics in relation to the discourse analytic and co-word methodologies described in Chapters Two and Three. The status of these definitions varies with respect to the diverse theoretical positions outlined in Chapter One. To take technology as an example, from the perspective of classical sociology, the definition summarises a boundary beyond which sociological explanations run up against material agency and so have to stop. From the perspective of social constructionism, the definition represents the outcome of a set of interests, that is, technology was so defined for some reason. The radical reflexive perspective might relate the reason to the needs of this thesis, and so back to ontological gerrymandering. Finally, actor-network theory might suggest that such *a priori* definitional work as that found in Chapter One maintains a particular, illegitimate distinction between those who define and explain and those who practice, that is, between theory and data.

In order to allow Chapters Five to Eight to proceed as realist accounts of research outcomes, discussion of the consequences of these different understandings of topic definition was postponed until now. However, these consequences now need addressing in terms of the question of reflexivity.

Topicalisation within social constructionism

Social constructionism has an ontology of human action, and this informs the way in which topicalisation occurs within discourse analysis. In other words, explanations are understood to have been presented when the state of affairs to be explained has been described as resulting from (or as being constituted by) a number of recognisably motivated actions or moves by specified actors. There are two particular features of this ontology that are germane to the question of reflexivity. Firstly, the orientation to *action* is perhaps most apparent in the work of conversation analysts such as Sacks (1992a, 1992b) and Psathas (1995), wherein explanations take the form of sequential actions such as ‘question - answer’ or ‘compliment - response’. In this thesis, I have focused on the actions of self-reference (personal deixis) and interest management in Chapters Six and Eight. The organisation of data, which is appropriately configured by transcription processes, is explained by reference to these actions. As a result of this ontology, topics can either be actions themselves, or resources by which actions are accomplished. Secondly, the orientation to specifically *human* actions (rather than, for example, technological agency) places the emphasis on interaction as an occasioned matter, so that an action is understood as indexical to a particular local context or sequence. It is in this sense that what is constructed is *social*. Resources, such as particular discursive repertoires, are available to interactants at any point in the sequence according to the degree to which they have previously worked up an entitlement to use those resources.

Within this ontology, topicalisation is a problematic matter. Conversation analysts often take a strongly empiricist line, in which (as noted in Chapter Two) any attempt by the researcher to define a topic prior to analysis is an act of “theoretical imperialism” (Schegloff 1997). They claim that social interaction displays ‘order at all points’ (Sacks 1984 p21-2), so that relevant topics, those oriented to by participants (such as turn-taking and sequential organisation), are common throughout all social interaction. I have argued in Chapter Two that such an idealistic approach is limited and impractical. Nevertheless, if matters other than the data at hand are to be allowed to influence the topic of the analysis, then how is this process to be protected against researchers merely using data

‘for support rather than for illumination’, as a drunkard might use a lamp post? The answer employed in this thesis has been, firstly, to select relevant pieces of interaction as ‘data’, secondly to announce an interest in three topics glossed as ‘scholarly communication’, ‘information chain’ and ‘technology’ and, thirdly, to use a combination of the data at hand and the author’s experience to develop operational definitions of these topics. Constructionist discourse analysis employs a view of language use as human interaction rather than as textual representation, so that during analysis the topics were understood in terms of what their use accomplished in the interviews. Therefore, even the operationalised definitions were only loosely applied in Chapters Six and Eight, wherein a series of commentaries were offered on the resources used by interviewees to accomplish self-reference and interest management.

Within an ontology of human interaction, reflexivity is potentially corrosive for research because it recursively topicalises the occasioned status of the current account. This recursive topicalisation is potentially consequential because future interactions always have the potential to recontextualise past interactions. (It is this potential revisionism that makes this kind of relativism invite the ethical and epistemological challenges discussed in Chapter One.) For example, this chapter (on reflexivity) is recontextualising Chapters Five to Eight, undermining the assumptions that enabled an easy reading of them as realist accounts of empirical research. In turn, Chapters Five to Eight (on realism) could have been read as a recontextualisation of the topics operationalised at the end of Chapter One. And so on. That is not to say that any of these accounts are ‘truer’ than the last, merely that all such accounts are forever unstable in particular ways.

Topicalisation within actor-network theory

Actor-network theory is ontologically semiotic. It is concerned, especially when deployed as co-word analysis, with patterns of words, with texts. Co-word analysis works with a representational view of language use²¹. That is, as Teil and Latour (1995) note, substantive words stand for micro-theories, and the co-word network is a way of displaying the structure between them. It is a notion of intra-textuality by association. From this perspective, it is not humanistic, since the semiotic move levels all distinctions (such as that between the human and the non-human) to the process of translation (see Chapter One). The emphasis on induction is reminiscent of the insistence of conversation analysts on the primacy of induction as the principal epistemological procedure. Whereas topic selection is addressed in CA by the social theory of ‘order at all points’ (see above), ANT theorists have suggested that analysts ‘follow the actors’ (Callon 1987). As noted in Chapter One, this is limited and insufficient, since it delegates topic selection to a common sense reading of history, with all the biases and lacunae that that entails. The additional solution adopted in this thesis has been to develop accountable ways in which researcher-initiated topic selection can be brought into co-word analysis. These categorical definitions (of ‘scholarly communication’, ‘information chain’ and ‘technology’) were then tested in the co-word networks to reveal how they were or were not present as categories in the interview data. By topicalising identifiable prior distinctions (the categorical definitions), the analysis was able to make precise claims about their relevance in certain texts.

21. It may be worth noting that the representational view of language use leads to analyses of the state of a text at a particular time, rather than with the progress of participants in an interaction. Therefore, it may be that co-word analysis is best suited to taking periodic cuts into evolving data (such as the benchmarking and evaluation interviews analysed in Chapter Five), while discourse analysis is best suited to a focus on the sequential development of a particular interaction. There may be a relationship between this distinction and that made by Saussure (1974) between the synchronic and diachronic aspects of language as a system.

The semiotic ontology described above allows the recursive topicalisation that potentially constitutes what might be called the analytic problem of reflexivity, as noted above. However, because the relations in ANT are between semiotic actants (words, texts, centres of calculation), rather than reflexive human actions, the recursion is benign. That is, meta-studies do not necessarily alter the meaning of the original. For example, whereas a discourse analysis of sections of Chapters One to Four offers a reading that is concerned with the role of those sections in the place at which they occurred, and this reading stands in some relation with any initial reading, a co-word analysis offers a spatial representation of those chapters. There is a significance to time and sequence in discourse analysis that is absent from co-word analysis. The difference is perhaps analogous to that between a guidebook and a map, where the former offers some sequenced account (diary) of the temporal features of a region (its history and regular events) and the latter picks out a specified set of spatial regularities. The offer of an account is an interactional entity - an offer should be either accepted or declined - so that it is irreducibly social and therefore reflexive (Garfinkel 1967). Selecting and representing regularities is not. It would appear that the differing ontologies of the two analytic methodologies have profound implications.

Ontology, epistemology and rules

So far, it has been argued that the results of analyses and meta-analyses need to be treated differently according to whether they were undertaken using discourse analysis or co-word analysis. This is because the respective procedures are based on differing ontologies (social interactionist and semiotic or representational), so that their outcomes have incompatible epistemological statuses. Epistemology concerns the rules for the generation of knowledge, and this characterisation gives us another way of talking about the differences between the two approaches.

Rules of interaction are more constitutive than regulative, that is, the rules are discoverable from the interaction rather than governing it. Hence, the objective of

analysis is to discover the rules. Conversation analysis is perhaps the most extreme version of this perspective, wherein there are no 'rules of analysis' except to strive for 'unmotivated observation'. As noted in Chapter Two, the craft skills involved in 'unmotivated observation' are "a key component in the training and progressive competence of new CA workers" (Schegloff 1999b p578). The characterisation of CA as a technique, again discussed in Chapter Two, refers to the idea that CA practitioners have, through this type of analysis, discovered certain of these constitutive rules (such as those concerning the sequential organisation of interaction) and that these discoveries are available to others.

In contrast, rules of representation are regulative, that is, the rules govern permitted relationships between the representation and that which is represented. As Law and Whittaker note, in co-word analysis "rules of selection were elaborated and deployed in order to impose simplicity on material that would otherwise be intractably complex. This was necessary if what had previously been distributed across time and space was to be concentrated at one point and treated as a whole." (Law and Whittaker 1988 p169). Hence, the characterisation of co-word analysis as a technique refers to the idea that there is a set of rules and procedures governing how we should move from the text to its representation.

Of course, there are similarities between the two positions outlined above. Both emphasise induction and are anti-theoretical in that sense. Furthermore, there are both rules governing how data is treated in conversation analysis²², and perhaps even discoverable rules constituting the co-word association structures of particular kinds of texts. However, for the present purposes I should like to draw attention to the profound distinctions between the positions. On the basis of these, considerable work would be required to render the results of each analytic procedure compatible with those of the other. That is, for example, the interactional boundary management work found using discourse analysis cannot easily be equated with the boundary regions between categories

22. For a guide, see Psathas and Anderson (1990) and, for a more critical commentary, see Ashmore and Reed (2000)

in the co-word maps. This is true not only of Chapters Five to Eight, but also of the reflexive detour above. What are the consequences of this for a realist research account?

Combining the analyses? (3)

As noted above, both the social constructionist and the actor-network approach disrupt a realist research account, though in different ways. However, their mutual incompatibility disrupts it in a distinct third way.

Garfinkel has noted what he called the ‘documentary method’ of accounts. He explains this as “treating an actual appearance as ‘the document of’, as ‘pointing to’, as ‘standing on behalf of’ a presupposed underlying pattern. Not only is the underlying pattern derived from its individual documentary evidences, but the individual documentary evidences, in their turn, are interpreted on the basis of ‘what is known’ about the underlying pattern. Each is used to elaborate the other.” (Garfinkel, 1967 p78). In a similar vein, Woolgar (1988b) has used the term ‘ideology of representation’ to describe a comparable practice in science²³. Realist research accounts conform to the documentary method most explicitly via the ideas of triangulation and replication.

Triangulation is a term borrowed from geography and concerns the positioning of entities in a representation (map) of a region. If an entity is described from a variety of perspectives then its position can be fixed. Similarly, in research accounts, if a topic can be described from a number of perspectives then its existence and important features can be presented as established facts, as artefacts of reality rather than as artefacts of a particular analytic procedure. Replication in science shares the main principle as triangulation, but differs in what varies between accounts. Analytic procedures vary in triangulatory accounts, whereas in replicative accounts the identity of the analyst (and perhaps the location and apparatus used for the procedure, but not the procedure itself)

23. Implicit self-reference is hard to avoid at this point.

vary. We might consider triangulation and replication together as duplicative devices designed to work up or construct entities such as research topics and outcomes as realistic facts.

Chapter One discussed briefly the problems of replication in relativist accounts. In this chapter I have tried not only to show the consequences of these problems but also to demonstrate one way of addressing them, that is by considering the relevant epistemological features of the analytic procedures that are candidate duplicative devices. The conclusion drawn has been that discourse and co-word analyses cannot successfully act as such devices. Any construction of this thesis as realist using the documentary method is deeply troubled by this result because it suggests that differing analyses of the same data, focusing on the same topics, can 'point to' different underlying 'real' patterns. It is a foundational axiom of realism that there is only one reality.

As well as offering a way of discussing duplicative devices, the idea of the documentary method also offers a more general characterisation of the research accounting process that is based on iteration. In other words, a realist research account describes the generation of knowledge in terms of at least one iterative cycle wherein the outcomes are expected to be better representations of the underlying patterns of reality than the initial descriptions (or 'glosses') of the topics. However, how are we to judge whether the outcomes of the discourse analyses or those of the co-word analyses are better representations? The relativist response is to characterise these outcomes as constructions rather than representations, in which case the existence of alternatives is not problematic because any number of criteria can be used to decide between them, should that be necessary on any occasion. As argued in this chapter, this relativism is not limited to epistemology (Bhaskar 1978) but extends, at least in the social sciences, to ontology.

Implications

If methodological differences can reflect incompatible ontological commitments, then the notions of replication and triangulation (what I have called above 'duplicative devices') become highly problematic. This is important because such notions are a fundamental part of realist accounting strategies. In Chapter Nine I argued that these strategies were members' concerns, and that analysts' concerns should be with how they were deployed, using what resources, on which occasions and to what effect. The value of this ethnomethodological approach is in its principled 'indifference' to ontology. In terms of SSK, it deals 'symmetrically' with accounts, so that the topic would be the practical reasoning revealed in how and where the interviewees' accounts, those from co-word analysis and those from discourse analysis were deployed. Of course, this leaves open the question of what resources are available to the analyst in carrying out and presenting this work.

In this thesis I have avoided the use of 'New Literary Forms', such as multi-vocal texts, to foreground reflexive concerns. This has been for a number of reasons. Firstly, such texts have been criticised as being difficult to read (Latour 1988) or "sterile" (Baber 1992). Secondly, adoption of the realist style offered a way of displaying (rather than just describing) its difficulties in dealing with such approaches as social constructionism and actor-network theory. Finally, I understood my task in this thesis as profoundly similar to that of the interviewees whose contributions were analysed in Chapters Five to Eight. Both the interviews with academic researchers and this thesis aim to document research-related practices in such a way as to construct the originator (interviewee or author) as a competent researcher. Regarding the interviews, this is a finding of the discourse analysis in Chapter Six; regarding the thesis, it is a reformulation of the principle that a thesis "should represent an original contribution to knowledge" and "should provide evidence of training in and the application of research methods appropriate to the field of study" (Loughborough University 1997). The interviews with practitioners such as librarians were found in Chapter Eight to reflect a similar documentary method. Common methods were used by both the interviewees and the

author to be recognisable as competent researchers. For example, researcher interviewees maintained a boundary between scholarly communication and technological matters. In the same way, the author maintained boundaries between theory, analysis and data. Where analysis was described as a matter of technique (for example, conversation analysis and elements of co-word analysis), this was either criticised by or distanced from theoretical concerns in the same way as interviewees distanced technology-as-automation from their scholarly or professional work. Again, many librarian interviewees configured researchers as 'end-users' in order to claim to be acting on their behalf. In the same way, topics were operationalised in Chapters One to Four in order that the resulting analysis could use them for particular accounting purposes.

In summary, both substantive and methodological considerations lead to the conclusion that much insight can be gained by adopting a relativist and ethnomethodological approach in research. However, this is not a call for a move to a new, safer, clearer position from which analysis can be practised. As Potter (1988 p47) notes, "if relativism is to be taken seriously, we do not need *a* move at all, but to be in a continual state of motion". Further research on scholarly communication, technology and the information chain cannot legitimately take these terms for granted at any point because there are epistemological (indeed, ontological) incompatibilities in the ways they can be implicated in accounts. The implications of this are far-reaching. For example, Meadows (1998), discussing 'information requirements', notes that "at the input end, research information is packaged in a variety of ways. At the output end, researchers can choose between these packages, selecting preferentially those that best serve their own research needs." (1998 p209-210). However, the evidence for 'research needs' is precisely the kind of preferential selection noted, so that this statement relies on information requirements as both a scholarly (or, perhaps, psychological) basis for members' (non-scholarly) action and an analytic finding, based on the evidence of that action. There would seem to be little to support the contention that these are epistemologically compatible positions for a single concept to hold, except that they *are* held as a practical accomplishment.

Further research would be useful in extending the topical and methodological range of relativist analysis and accounting. In particular, both co-word and discourse methodologies offer ways in which the ideas of scholarly communication, the information chain and technology could be further explored. Indeed, these topics could be supplemented, for example by a consideration of matters commonly glossed as 'economic' or 'psychological'. That is, how are these matters available to members as resources? The range of participants in the research, and the types of account used as 'data', could also usefully be expanded to investigate the ways in which the reliance of this project on data from the FIDDO Project (Jacobs et al 2000) was influential. For example, early plans for this project included discourse and co-word analyses of both published papers and of messages from an online debate.

In terms of methodology, no particular approach is intrinsically more suitable than any other for relativist research practice. Much of this project could be read as straightforwardly empirical and, indeed, both conversation analysis and co-word analysis have been described in these terms (Pollner 1991; Teil and Latour 1995). Although surveys and experiments are usually considered thoroughly empirical, this is not necessarily so (Garfinkel 1972b). The indexical character of social action is a ubiquitous, if elusive, resource for analysis, regardless of the methods at hand.

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Appendix A: Excerpts from FIDDO Research Methodology Toolkit: The interview schedules

The following represent the schedules used in the interviews conducted as a part of the UK eLib FIDDO Project. The verbatim transcripts from these interviews comprise the data for Chapters Five to Eight. There are three schedules:

- benchmarking interviews with academic researchers;
- evaluation interviews with academic researchers;
- interviews with information professionals.

In all cases, the author was the interviewer.

The full toolkit is published in:

*Jacobs et al (2000) Planning document access: options and opportunities. London:
Bowker-Saur*

Interview schedule: benchmarking interview with academic researchers

I'd like you to imagine a time when you had a couple of hours, or perhaps a whole afternoon, free to focus on some research work you had in hand. You have time to search for and get hold of literature that you need for this research work.

- B.1. Can you give an estimate of the number of papers you would scan for each one you would want to actually read thoroughly? Is scanning the abstract enough?
[Aim of question is threefold: to get researchers thinking in 'research' mode; to emphasise the distinction between browsing and ordering documents; and to assess the information required before a document is ordered.]
- B.2. Talk me through how you would typically get hold of a paper for which you already had a reference (if journal was in library? if not?)
[Aim of question is to get a rich description of researcher's perception of their own current practice]
- B.3. How much does each article cost you or your department on average? Are these costs reasonable / when would they stop being reasonable? Who has control over the budget: library / department / enduser? (if journal was in library? if not?)
[Aim of questions is not only to get the information, but to assess differences between researcher's perception and assessment of costs, true costs to them, their department and their institution]

- B.4. How much time do you have to dedicate to getting hold of a paper in the normal way - using your usual routes (i.e. time that you are actually concentrating on getting hold of the paper)?
[Aim of question is not only to get the information, but to assess whether this time is noticed by the researcher to the extent that they can answer the question easily - have they thought about it before being asked?]
- B.5. How long do you have to wait between ordering and receiving the paper, during which time you can be doing other things?
[Aim of question is not only to get the information, but to assess importance of multitasking. Also to assess whether this time is noticed and counted - how important is speed of delivery? How is time an issue in document access?]
- B.6. In what format do / would you prefer to receive material? Why? (ease of reading / file compatibility / speed of download / other)
[Aim of question is to assess perceived issues in print / electronic formats and conversion between them]
- B.7. What are the best and worst aspects of the current system for document access?
[Aim of question is to assess user's general reaction to the library service and particular systems]
- B.8. Do you feel in control of your access to documents?
[Aim of question is to assess user perceptions of the extent to which they believe their work is constrained by the service and systems used]
- B.9. How easily does the current document access system fit into your overall way of doing things?
[Aim of question is to assess perceived compatibility between service / systems used and the tasks they are supporting]

- B.10. Did you have to ask for help when first obtaining documents using the current system? Was that help forthcoming? Was it adequate, effective and easy to understand?
[Aim of question is to assess both perceived difficulty of accessing documents and system / service features apparent to users to help them]
- B.11. What problems do you think a new user might have when using the current system for the first time?
[Aim of question is to assess the degree to which the systems are perceived as easy to learn in the context of the library service]
- B.12. What do you use the library for? What would you like to use it for?
[Aim of question is to assess the place of the library as an institution in the user's task-oriented world]
- B.13. If you could have instant access to any document, would it make a difference to the quantity or quality of your research? In what way? Is it desirable?
[Aim of question is to assess the perceived effects of the constraints of current systems on user's work]
- B.14. Please describe your computer / printer / network configuration
[Aim of question is not only to get the information, but to explore researcher's technical knowledge]
- B.15. Have you downloaded files from the internet? How comfortable would you be / are you downloading files from the internet and printing them out?
[Aim of question is not only to get the information, but to explore researcher's experience of and confidence in using networked information sources]

Interview schedule: evaluation interview with academic researchers

Note: This template may need to be adjusted depending on the features of the particular system being evaluated

Again, I'd like you to imagine the times when you used SYSTEM to (search for and) get hold of literature that you need for this research work.

E.1. What were your general impressions of SYSTEM?

[Aim of question is to get user's impressions of the system as they are structured by the user – that is, relatively unprompted by the researcher]

E.2. Did SYSTEM cover the kinds of subjects are you wanted documents in?

E.3. Did SYSTEM cover these subjects in enough depth (i.e. did searches bring up enough hits)?

E.4. Did SYSTEM cover these subjects appropriately (i.e. were the hits from quality journals, etc)

[Aim of these questions is to assess the perceived coverage of the system, and its appropriateness to the user's needs. The coverage reported here may or may not be related to the 'actual' coverage]

E.5. If you could have access to any document via SYSTEM, what problems would still remain with it?

[Aim of question is to assess user's views of aspects of the system other than its coverage]

E.6. Would / will you regularly use SYSTEM?

If N - why not? Which alternatives are better? And in what way are they better?

If Y - what would / will you do less of to make time to use SYSTEM?

[Aim of question is to get user to compare the system with other methods of getting hold of documents, and so to tell the researcher which criteria are important to the user in such comparisons]

E.7. Were there particular issues with receiving documents in electronic format?

[Aim of question is to get user's views on their experience of using electronic format, as compared (perhaps) with their general views on the subject as expressed in the initial interview]

E.8. Was it quicker using SYSTEM than it would have been to use the traditional way of doing things? Why? Which part of the process was quicker / better (or slower / worse?)

[Aim of question is to assess whether time was an important issue in using the system]

E.9. What were the best and worst aspects of using SYSTEM for document access?

[Aim of question is to reassess user's general reaction to the system]

E.10. Did you feel in control of your access to documents using SYSTEM?

[Aim of question is to assess user perceptions of the extent to which they believed their work was constrained by the system used]

E.11. How easily did SYSTEM fit into your overall way of doing things?

[Aim of question is to assess perceived compatibility between system used and the tasks it was supporting]

E.12. Did you have to ask for help when first obtaining documents using SYSTEM?

Was that help forthcoming? Was it adequate, effective and easy to understand?

[Aim of question is to assess both perceived difficulty of accessing documents and system / service features apparent to users to help them]

- E.13. What problems do you think a new user might have when using SYSTEM for the first time?
[Aim of question is to assess the degree to which the system was perceived as easy to learn]
- E.14. Do you think having access to SYSTEM has / would have an effect on the quantity or quality of your research?
[Aim of question is to assess perceived potential of system in relation to constraints of current options, as identified in the initial interview]
- E.15. Were there any technical issues using SYSTEM?
[Aim of question is to assess user-perceived technical reliability of the system]

Interview schedule: interview with information professionals

The aim for the interviews was for us to understand the way members of the academic information chain viewed the present and the future of document access, what the major issues were for them, and how they saw themselves dealing with those issues. It is sometimes difficult to talk about what are often very practical issues in these abstract ways, and so we developed a set of four hypothetical scenarios on which to base the interviews. These described different ways in which end-users could obtain documents, with different potential roles for the library and others in the information chain. The descriptions of the scenarios were left fairly vague, so that interviewees would be able to focus on the significant unresolved issues in them. The four scenarios were:

Scenario 1:

Users search a new subject-based full-text database on the Web, viewing those documents in which they are interested, with an option to print them out. There are options to view / print documents in text-only or in PDF format. All full-text is copyright-cleared, and the database provider charges a flat-rate access fee, depending on how many simultaneous accesses are allowed. The average delay between a user's decision to have a (printed) document and actually having it is 10 mins.

Scenario 2:

Users search a known and familiar subject database on the Web, ordering photocopies of those documents in which they are interested by clicking on the appropriate button. The documents are then sent by a supplier directly to the users' via the postal service. The documents are available under the 'fair dealing' provisions of UK copyright law. There is a subscription charge to the database, plus a charge for each document ordered, depending on the supplier. The library can set the system to try certain suppliers for particular journal titles or publishers. The average delay between a user's decision to have a (printed) document and actually having it is three days.

Scenario 3:

Users input their requests for documents to the university library via a Web form, or via email. The library decides on the best supplier for each article and makes the order. The document is delivered to the library, checked in and forwarded to the users via the internal mail. There is a charge for each document. The average delay between a user's decision to have a (printed) document and actually having it is five days.

Scenario 4:

Users send their requests for documents via email to a document supplier. The documents are supplied in PDF format as email attachments within a couple of days if the item is in the supplier's collection, or one - two weeks if not. There is a charge for each document, consisting of a flat rate delivery charge plus a variable copyright charge depending on the publisher of the document. The documents are therefore copyright-cleared.

A series of questions were asked for each hypothetical scenario, designed to elicit discussion of the practicalities and potentials of each scenario:

1. Who would you expect to pay? How?
2. Who regulates access?
3. What university / external infrastructure is necessary?
4. What is the role of the library?
5. Compared to journals-on-the-shelf, who wins and who loses?

(for example; publishers, suppliers, libraries, researchers, students, university administration, no-one)

Appendix B: Interviews with academic researchers: list of words from which the prompt words were derived

The following list of 543 words were the most common substantive words in the speech turns of academic researchers in the FIDDO interviews (see Chapter Four).

ABI	AUTHOR	BUY
ABSTRACT	AVAILABILITY	CAMBRIDGE
ABSTRACTING	BANK	CAMPUS
ACADEMIC	BANKING	CAR
ACADEMICS	BARRIERS	CASH
ACCESS	BIBLIOGRAPHIC	CATALOGUE
ACCESSIBILITY	BIBLIOGRAPHIES	CD
ACCIDENT	BIDS	CENTRE
ACCOUSTICS	BIOGEOGRAPHY	CHAPTER
ACQUISITIONS	BIOLOGICAL	CHARGE
ACROBAT	BIRMINGHAM	CHARTS
ADDRESS	BL	CHEAP
ADMIN	BLACKWELLS	CHECKED
AFTERNOON	BLDSC	CHEMISTRY
AGES	BODLEAN	CITATION
AGREEMENT	BOOK	CITE
AIRPORT	BOOKMARK	CLASS
ANBAR	BOUNDARIES	CLEAR
ANNOYED	BOURNEMOUTH	CLICK
APPLICATION	BROWSE	COLLEAGUE
AREAS	BUDGET	COLLECTION
ARTICLE	BUILDING	COLOUR
ASSISTANT	BULGARIA	COMFORT
ASTON	BUSINESS	COMMERCIAL
ATMOSPHERE	BUSY	COMMUTING
ATTENTION	BUTTON	COMPANIES

COMPENDEX	DELAYS	EDITIONS
COMPLAIN	DELIVER	EDITOR
COMPLEX	DEPARTMENT	EDUCATION
COMPREHENSIVE	DEPTH	EFFORT
COMPUTER	DERBY	EFORMAT
COMPUTING	DESK	EI
CONFERENCE	DESKTOP	ELECTRIC
CONFIDENCE	DEVELOPMENT	EMAIL
CONFUSION	DEWEY	EMPIRICAL
CONNECTED	DIAGRAM	EMPLOYMENT
CONSUMER	DIRECTORIES	ENCARTA
CONTENTS	DISC	ENGINEERING
CONTROL	DISCIPLINE	ENTRIES
CONVENIENCE	DISCONNECT	ENVIRONMENT
CONVENTIONAL	DISCOURSE	ERROR
COPIED	DISCOVER	ETHICS
COPIES	DISRUPT	EUROPEAN
COPYRIGHT	DOCDEL	EVENINGS
CORE	DOCTORAL	EXPENSIVE
CORPORATE	DOCUMENT	EXPERIMENT
CORRIDOR	DOCUMENTATION	EXPLAINED
COST	DOOR	EXPLORATORY
COUNTER	DOWNLOAD	FACULTY
COURSE	DOWNSTAIRS	FAILURE
COVER	DOWNTIME	FAST
CRASH	DRAFTS	FAULT
CROSSDISCIPLINARY	EASE	FEEDBACK
CUSTOMER	ECOLOGICAL	FIELD
CUT	ECONLIT	FIELDWORK
DATA	ECONOMETRICS	FILE
DATABASE	ECONOMIC	FILTER
DATE	ECONOMICS	FINANCE
DAY	ECONOMIST	FINDING
DEADLINE	EDIT	FIRSTSEARCH

FISHING	HMSO	KEY
FLOOR	HOME	KEYWORD
FORM	HOMEPAGE	KNOWLEDGE
FORMAT	HOUR	LAB
FORMFILLING	HOUSE	LAN
FRAGMENTATION	HTML	LANGUAGE
FRIEND	HYBRID	LAPTOP
FRUSTRATED	ICONS	LASER
FT	IDEA	LATE
FULLTEXT	IDEAL	LAZY
FUND	ILL	LEARNED
GAPS	INCONVENIENT	LECTURE
GARBAGE	INDEX	LECTURER
GENDER	INDIA	LEEDS
GEOABSTRACTS	INDUCTION	LEGISLATION
GEOBASE	INFORM	LEICESTER
GEOGRAPHICAL	INFORMATION	LEPROSY
GLANCE	INSPEC	LIBRARIAN
GLOBALISATION	INSTALLED	LIBRARIES
GRANT	INSTANTLY	LIMIT
GRAPHICS	INSTITUTION	LINK
GRAPHS	INSTRUCTION	LISTS
GRINDING	INTERNET	LITERATE
GUIDANCE	IRRELEVANT	LITERATURE
HANDS	IRRITATION	LIVERPOOL
HANSARD	ISSUE	LOAD
HARDCOPY	ITERATIVE	LOAN
HARDWARE	JANET	LOCAL
HASSLE	JOB	LOCATE
HEADINGS	JOURNAL	LOGICAL
HEFCE	JOURNALISTIC	LONDON
HELPED	JOURNEY	LOOKING
HISTORY	JUDGEMENT	LOUGHBOROUGH
HITS	KEEPING	LUDDITE

MAC	MULTIMEDIA	PEOPLE
MACHINE	MULTITASK	PERFORMANCE
MAGAZINE	NAME	PERIODICAL
MAILBOX	NAVIGATION	PHD
MAILING	NEPAL	PHONE
MANAGEMENT	NETSCAPE	PHOTOCOPIED
MANAGERS	NETWORK	PHOTOCOPIER
MANAGING	NEWSGROUPS	PHOTOCOPIES
MANCHESTER	NEWSPAPER	PHOTOGRAPH
MANIPULATE	NIGHTMARE	PHYSICAL
MARK	NORMALLY	PHYSICS
MARKET	NOTTINGHAM	PICTURES
MARKETING	NOTTINGHAMTRENT	PILKINGTON
MATERIAL	NOVICE	PLATFORMS
MATURE	OBSCURE	POLITICS
MBA	OFFICE	PORTABLE
MCB	OPERATIONAL	POST
MEDICAL	ORDER	POSTSCRIPT
MEDLINE	ORGANISATION	POSTGRAD
MEMORY	OUTPUT	POWER
MENU	OVERLOAD	POWERTRAC
MESSAGE	OVERSEAS	PQD
METHOD	PAGE	PRACTITIONER
METHODOLOGY	PAID	PREVIEW
METHODS	PAIN	PRICE
MICKLEOVER	PAPER	PRINT
MICROFICHE	PAPERBACK	PRINTER
MINUTE	PARAGRAPH	PRINTOUT
MISSED	PASSWORD	PROBLEM
MODEM	PASTE	PROCEEDINGS
MODULES	PATIENCE	PROCESSOR
MONEY	PAYING	PRODUCTIVE
MONTH	PC	PROFESSIONAL
MORNING	PDF	PROFESSOR

PROGRAMME	REVISING	SKIM
PROGRAMMING	RIVER	SLOWER
PROJECT	ROOM	SOAS
PROPOSALS	ROUTE	SOCIOLOGY
PSYCHOLOGY	SABBATICAL	SOFTWARE
PUBLICATION	SAVE	SOURCE
PUBLISH	SB	SPACE
PUBLISHERS	SCAN	SPEED
PURCHASE	SCANNER	STATISTICAL
QUERIES	SCHEDULE	STOCK
QUESTION	SCHOLARLY	STORE
QUEUE	SCIENCE	STRAIGHTAWAY
QUICKER	SCREEN	STUDENT
QUOTA	SEARCH	STUDIES
QUOTES	SEARCHES	SUBJECT
RAE	SECONDS	SUBSCRIBE
RAM	SECRETARY	SUMMARY
RANGE	SECURITY	SUPERVISING
READ	SELECTION	SUSSEX
READER	SELFEXPLANATORY	SYNOPSIS
READINGS	SEMESTER	SYSTEM
REFEREED	SEMINAR	TABLE
REFEREES	SERENDIPITOUS	TASK
REFERENCE	SERIAL	TAUGHT
REFERENCED	SERIES	TECHNICAL
REHABILITATION	SERVER	TECHNICIAN
RELIABLE	SERVICE	TECHNIQUES
REQUESTING	SESSION	TEDIOUS
RESEARCH	SETUP	TELNET
RESEARCHER	SHARING	TERM
RESOURCE	SHEFFIELD	TERMINAL
RESULTS	SHELF	TERMS
RETAIL	SHORTCUT	TEXT
RETRIEVAL	SITE	TEXTBOOKS

THEORY	VIEWER
THESIS	VISIT
TIFF	VOLUME
TIME	VOUCHER
TIMECONSUMING	WADE
TIMETABLE	WAIT
TITLE	WALK
TODAY	WARWICK
TOOLS	WASTED
TOPIC	WEB
TOURISM	WEBSITE
TRACKING	WEBSPIRS
TRADE	WEEK
TRADITIONAL	WEEKEND
TRAIN	WIDE
TRANSPORT	WORD
TRAVELLING	WORK
TRENT	WORLD
TRIP	WRITE
TRUST	WRITER
TUTORIAL	YAHOO
TYPEWRITER	YEAR
UNDERGRADUATE	YORK
UNIVERSITIES	
UONOTTINGHAM	
UPGRADE	
USAGE	
USEFUL	
USELESS	
USER	
VALUE	
VERIFY	
VGA	
VIDEO	

Appendix C: Interviews with information professionals: list of words from which the prompt words were derived

The following list of 1172 words were the most common substantive words in the speech turns of information professionals in the FIDDO interviews (see Chapter Four).

ABI	ADVANCE	APPROVAL
ABILITY	ADVANTAGE	ARCHIVE
ABSENCE	ADVERTISE	AREA
ABSTRACT	ADVICE	ARGUE
ABSTRACTING	AFFORD	ARIEL
ABUSE	AFTERNOON	ARRANGEMENT
ACADEMIC	AGE	ARRIVE
ACADEMICS	AGENT	ARTEMAIL
ACCEPT	AGGREGATED	ARTICLE
ACCESS	AGREEMENT	ARTIFICIALLY
ACCOUNT	ALERT	ASK
ACCOUNTABILITY	ALLOCATE	ASSEMBLING
ACORN	ALLOTMENT	ASSIGN
ACQUIRE	ALLOW	ASSIST
ACQUISITION	ALLOWANCE	ASSISTANTS
ACROBAT	ALTERNATIVE	ASSOCIATED
ACT	ANALOGY	ASSUME
ACTION	ANALYSIS	ATHENS
ACTIVE	ANBAR	ATTACHMENT
ACTIVITY	ANNOUNCE	ATTRACTION
ADAPT	ANNUAL	AUTHENTICATION
ADDITIONAL	ANSWER	AUTHORISED
ADDRESS	APPEAR	AUTHORITATIVE
ADEQUATE	APPLICATIONS	AUTHORITY
ADMINISTRATION	APPLY	AUTHORS
ADMINISTRATOR	APPROACH	AUTOMATE
ADONIS	APPROACHED	AUTOMATIC
ADOPT	APPROPRIATE	AVAILABILITY

AVERAGE	BOSTON	CAUSE
AWARENESS	BOTHER	CDROM
AWFUL	BOTTOM	CEILING
BACKRUNS	BOUGHT	CENTRAL
BACKUP	BOUND	CENTRALISATION
BAD	BOX	CERTAIN
BALANCE	BRICK	CHAIN
BANDWIDTH	BRILLIANT	CHAIRMAN
BANK	BRING	CHALLENGE
BARRIER	BRITISH	CHANCELLOR
BASE	BROAD	CHANGE
BASIC	BROWSE	CHANNEL
BATH	BROWSER	CHAOTIC
BEAUTY	BUDGET	CHARGE
BECOME	BUILD	CHASING
BEGIN	BULK	CHEAP
BENEFIT	BURDEN	CHECK
BETAMAX	BUSINESS	CHEQUE
BIBLIOGRAPHIC	BUTTON	CHEST
BIDS	BUY	CHIEF
BIG	BYPASS	CHOICE
BILL	CABLE	CHURNED
BINDING	CACHE	CIRCULATION
BIOLOGICAL	CALL	CIRCUMSTANCES
BIT	CAMPUS	CITATION
BL	CANCEL	CLA
BLACKWELLS	CAPABILITY	CLAIM
BLAME	CARD	CLASS
BLANK	CAREER	CLEAR
BLANKET	CAREFUL	CLEARANCE
BLDSC	CARRY	CLICK
BMA	CARVE	CLIENT
BOARD	CASE	CLOSE
BODY	CASH	CODE
BOOK	CATALOGUE	COLLEAGUES
BOOTING	CATALOGUING	COLLECT
BORROWING	CATEGORIES	COLLECTION

COLLEGE
COLOUR
COMBINATION
COMFORTABLE
COMMENT
COMMERCIAL
COMMISSION
COMMIT
COMMON
COMMUNICATION
COMMUNITY
COMPANY
COMPARE
COMPETE
COMPETITORS
COMPLETE
COMPLEX
COMPLY
COMPREHENSIVE
COMPUTER
CONCEPT
CONCERN
CONDITIONS
CONFERENCES
CONNECTION
CONSERVATIVE
CONSIDER
CONSIDERABLE
CONSISTENT
CONSORTIUM
CONSTANTLY
CONSTRAINTS
CONSTRUCT
CONSULT
CONSUMER
CONSUMING
CONTACT

CONTENT
CONTENTS
CONTEXT
CONTINUE
CONTRACT
CONTRIBUTE
CONTROL
CONVENIENCE
CONVENTIONAL
CONVINCED
COPE
COPIES
COPY
COPYRIGHT
CORE
CORPORATE
CORPORATIONS
CORRECT
COST
COUNTRY
COURSES
COVER
CRANFIELD
CREATE
CREDIBILITY
CREDIT
CRITICAL
CRUCIAL
CULTURE
CUMBERSOME
CURRENCY
CURRENT
CUSTOMER
CUT
DANGER
DATA
DATABASE

DATE
DAWSONS
DAY
DEAD
DEAL
DEBATE
DEBIT
DECENT
DECIDE
DECLARATION
DEDICATED
DEFINE
DEFINITE
DEGREE
DELAY
DELIGHTED
DELIVER
DEMAND
DEPARTMENT
DEPEND
DEPLOY
DEPOSIT
DEPTH
DESCRIBE
DESIRABLE
DESK
DESKTOP
DETAIL
DETERMINE
DEVELOP
DEVELOPMENT
DEVOLUTION
DIAGRAM
DIFFICULT
DIGITAL
DIRECT
DIRECTION

DIRECTOR
DISADVANTAGE
DISASTER
DISCIPLINE
DISCOUNT
DISCRETION
DISCUSSION
DISENFRANCHISED
DISPARITY
DISTANCE
DISTINCT
DISTRIBUTE
DIVERSIFYING
DOCUMENT
DOCUMENTATION
DOLLARS
DOUBT
DOWNLOAD
DOWNSIDE
DRAMATIC
DROP
DYNAMICS
EASY
EBSCO
ECONOMIC
EDD
EDUCATION
EFFECTIVE
EFFICIENT
EFFORT
EI
ELECTRONIC
ELSEVIER
EMAIL
EMERALD
ENABLE
ENCOURAGE

ENCRYPTION
END
ENDUSER
ENFORCE
ENGINE
ENGINEERING
ENGLISH
ENORMOUS
ENQUIRY
ENSURE
ENTITLED
ENVELOPE
ENVIRONMENT
ENVISAGE
EQUAL
EQUATION
EQUIPMENT
EQUIVALENT
ERROR
ESOTERIC
ESSENTIAL
ESTABLISH
EUROPE
EVALUATE
EVENTUALLY
EVIDENCE
EVOLVE
EXAMPLE
EXCEED
EXCELLENT
EXCEPTIONS
EXCESS
EXERCISE
EXIST
EXPANDING
EXPECT
EXPENDITURE

EXPENSIVE
EXPERIENCE
EXPERIMENTING
EXPERT
EXPLAIN
EXPLICIT
EXPLOIT
EXPLORER
EXPLORING
EXTENSION
EXTERNAL
EXTREME
EYE
FACED
FACILITATE
FACILITY
FACT
FACULTY
FAILURE
FAIR
FALL
FAMILIAR
FAST
FAVOUR
FAX
FEAR
FEASIBLE
FEATURE
FEE
FEED
FEEDBACK
FEEL
FEES
FIDDO
FIELD
FIGURE
FILE

FILL
FINAL
FINANCE
FIND
FINITE
FIRE
FIXED
FLAGGED
FLAVOUR
FLEXIBLE
FLICKING
FLOW
FOCUS
FOLLETT
FORCES
FORM
FORMAT
FORWARD
FRAME
FREE
FREEDOM
FREQUENTLY
FRIEND
FRIENDLY
FRINGE
FRUSTRATION
FULL
FUNCTION
FUND
FUNDAMENTAL
FUTURE
GAIN
GAME
GARBLLED
GATEKEEPER
GATEWAY
GENERATE

GENERATION
GERMANY
GLOBAL
GOOD
GRADUATE
GRANT
GREAT
GREY
GROUP
GROWTH
GUARANTEE
GUESS
GUIDANCE
HALL
HAND
HANDLE
HANG
HAPPY
HARD
HARDCOPY
HARDWARE
HARM
HASSLE
HAT
HATE
HEAD
HEADING
HEARING
HELP
HIGH
HISTORY
HIT
HOLD
HOLDER
HOME
HONEST
HOPE

HOST
HOUR
HOUSE
HULL
HUMAN
HUMANITIES
HYBRID
ID
IDEA
IDEAL
IDENTIFY
IEE
IGNORE
ILL
IMAGE
IMAGINE
IMMEDIACY
IMPACT
IMPERIAL
IMPLEMENT
IMPLICATION
IMPORTANT
IMPOSE
IMPOSSIBLE
IMPRESSED
IMPRESSION
IMPROVE
INCENTIVE
INCLUDE
INCOME
INCORPORATE
INCREASE
INCURRING
INDEPENDENT
INDEX
INDIVIDUAL
INFLATION

INFLUENCE	ISI	LEVEL
INFORM	ISSUE	LIAISON
INFORMAL	ITEM	LIBERTAS
INFORMATION	JANET	LIBRARIAN
INFOSTORE	JAVA	LIBRARIANSHIP
INFRASTRUCTURE	JOB	LIBRARY
INHERENT	JOSTLING	LICENCE
INITIAL	JOURNAL	LIMIT
INPUT	JOURNALSONLINE	LINK
INSERT	JUDGE	LIST
INSISTED	JUMP	LISTENING
INSTANCES	JUSTIFY	LITERATE
INSTANT	KEEN	LITERATURE
INSTINCT	KEY	LITTLE
INSTITUTE	KIDS	LIVE
INSTITUTION	KNOWLEDGE	LIVING
INSTRUCTIONS	LAB	LOAD
INTEGRATE	LABORIOUS	LOAN
INTENDED	LABOUR	LOCAL
INTENSIVE	LAMDA	LOCATE
INTERACTION	LAN	LOCATIONS
INTERCONNECTIONS	LANGUAGE	LOG
INTEREST	LARGE	LOGIC
INTERFACE	LAST	LONDON
INTERMEDIARY	LATER	LONG
INTERNAL	LAUNCHED	LOOK
INTERNATIONAL	LAW	LOOP
INTERNET	LAYER	LOSE
INTERVENTION	LEAD	LOUGHBOROUGH
INTRANET	LEAP	LOW
INTRODUCE	LEARN	MACHINE
INVEST	LEAST	MAIL
INVOICE	LEAVE	MAILBOX
INVOLVE	LEEDS	MAINSTREAM
IP	LEGITIMATE	MAINTAIN
IRRELEVANT	LEND	MAJOR
IRRESPECTIVE	LESS	MAJORITY

MAN	MODULE	OCLC
MANAGE	MOMENT	OFFER
MANAGEMENT	MONEY	OFFICE
MANCHESTER	MONITOR	OFFICIALLY
MANDATORY	MONOGRAPHS	OLD
MANUAL	MONTH	ONLINE
MARK	MORNING	OPAC
MARKET	MOVE	OPEN
MARKETING	MULTIDISCIPLINARY	OPERATE
MASSIVE	MULTIPLE	OPERATION
MATERIAL	NAME	OPERATIVE
MATHS	NATIONAL	OPPORTUNITY
MAXIMUM	NATURE	OPTIMISTIC
MCB	NECESSARY	OPTION
MEASURING	NEED	ORDER
MECHANISM	NEGOTIATE	ORGANISATION
MEDIATION	NERVOUS	ORGANISE
MEDICINE	NESLI	ORIENTED
MEDLINE	NET	ORIGINAL
MEET	NETSCAPE	OSTENSIBLY
MEETING	NETWORK	OUTDATED
MEGA	NEUTRAL	OUTPUT
MEGABYTES	NIGHT	OVERLOAD
MEMBER	NIGHTMARE	OWNERSHIP
MESSAGE	NISSEBSCO	OXFORD
MESSY	NOMINAL	PACKAGE
METADATA	NORMALLY	PAGE
METHOD	NORTH	PAID
MIDDLE	NOTABLE	PAPER
MINIMAL	NOTICE	PARADIGM
MINORITY	NOTTINGHAM	PARALLEL
MINUTE	NT	PARAMETERS
MIRROR	OBJECT	PARTNERSHIP
MISS	OBJECTIVE	PARTY
MIX	OBLIGATION	PASS
MODE	OBTAINING	PASSWORD
MODEL	OCCASIONAL	PAST

PASTE	POSITIVE	PROFESSIONAL
PATRONS	POSSIBLE	PROFESSOR
PAY	POST	PROFIT
PC	POSTGRADUATE	PROGRAMME
PDF	POT	PROGRESS
PEOPLE	POTENTIAL	PROJECT
PERCEIVED	POUND	PROMOTED
PERCENT	POWER	PROPER
PERCEPTION	PR	PROPORTION
PERFORMANCE	PRACTICAL	PROQUEST
PERIOD	PRACTICE	PROVE
PERIODICAL	PRECISE	PROVIDE
PERIPHERAL	PREDICT	PROVIDER
PERMITTED	PREFERENCE	PROVISION
PERSONNEL	PREMIUM	PUBLIC
PERSPECTIVE	PREPAID	PUBLICATION
PHARMACEUTICAL	PRESENT	PUBLICISING
PHD	PRESS	PUBLISH
PHOTOCOPIED	PRESSURE	PUBLISHER
PHOTOCOPIER	PRESTIGE	PURCHASE
PHOTOCOPIES	PRESUME	PURPOSE
PHRASE	PREVALENT	PURSUE
PHYSICAL	PREVIOUS	QUALIFIED
PHYSICS	PRICE	QUALITY
PICK	PRIMARY	QUESTION
PIE	PRINCIPLE	QUEUE
PIECE	PRINT	QUICK
PLACE	PRINTER	QUOTA
PLAN	PRIORITY	QUOTE
PLAY	PRIVATE	RAISE
PLUG	PRIVILEGE	RANGE
POCKET	PROACTIVE	RAPID
POLICY	PROBLEM	RARE
POLITICALLY	PROCEDURE	RATE
POPULAR	PROCESS	RATION
PORT	PROCITE	READ
POSITION	PRODUCT	READABLE

READER	REQUESTER	SCALE
REAL	REQUIRE	SCANNED
REALISE	REQUIREMENT	SCENARIO
REASON	RESEARCH	SCENES
REASONABLE	RESEARCHER	SCEPTICAL
REASSURANCE	RESIDENCE	SCHEME
RECEIVE	RESISTANT	SCHOOL
RECOGNISE	RESOURCE	SCIENCE
RECOMMEND	RESPECT	SCIENTIFIC
RECOMPENSE	RESPONSE	SCOPE
RECORD	RESPONSIBILITY	SCRAP
RECOUP	RESTRICT	SCREEN
REDUCE	RESTRICTIONS	SEAMLESS
REFER	RESULT	SEARCH
REFEREED	RETAIN	SEARCHBANK
REFERENCE	RETRIEVE	SEARCHES
REGION	RETROSPECTIVE	SECOND
REGISTERED	REVENUE	SECONDARY
REGULAR	REVIEW	SECTION
REGULATE	RIDICULOUS	SECTOR
RELEVANT	RISE	SECURE
RELIABLE	RISK	SEEKING
RELUCTANCE	ROAD	SELECT
RELY	ROBUST	SELECTION
REMEMBER	ROLE	SELL
REMIND	ROOM	SEND
REMOTE	ROUTE	SENIOR
REMOVED	RULE	SEPARATE
REPEATED	RUN	SERENDIPITY
REPLACE	SAFETY	SERIAL
REPLY	SALES	SERIOUS
REPORTS	SAMPLE	SERVED
REPRESENT	SATELLITE	SERVER
REPRESENTATIVE	SATISFACTION	SERVICE
REPUBLISH	SATISFY	SETUP
REPUTATION	SAVE	SHARED
REQUEST	SAVINGS	SHEETS

SHELF	SPINE	SUPPLY
SHELVERS	SPLIT	SUPPORT
SHIFT	STACK	SURPRISE
SHOP	STAFF	SURVEYS
SHORT	STAGE	SWETS
SHOVE	STANDARD	SWITCH
SIGN	START	SYSTEM
SIGNATURE	STATEMENT	TAB
SILVERLINKER	STATES	TABLE
SILVERPLATTER	STATISTICS	TARGET
SIMILAR	STATUS	TASK
SIMPLE	STAY	TAUGHT
SIMULTANEOUS	STEP	TEAM
SINGLE	STOCK	TECHNICAL
SITE	STOP	TECHNIQUES
SITUATION	STORE	TELEPHONE
SIZE	STRANGE	TEMPLATE
SLOW	STRATEGY	TERM
SMALL	STREAM	TERMINAL
SOCIAL	STRONG	TERRITORY
SOCIETY	STRUCTURE	TEXT
SOFTWARE	STRUGGLE	THEME
SOLVE	STUDENT	THEORY
SOON	STUDIES	THESAURUS
SOPHISTICATED	SUBJECT	THREAT
SORTED	SUBSCRIBE	THRESHOLD
SOUND	SUBSCRIBERS	THROWN
SOURCE	SUBSCRIPTION	TIE
SPA	SUBSIDISING	TIME
SPACE	SUBSTITUTE	TITLE
SPEAK	SUCCESSFUL	TOOLS
SPECIAL	SUFFER	TOPICS
SPECIALIST	SUFFICIENT	TOTAL
SPECIFICATION	SUGGEST	TOUCH
SPECTRUM	SUPERJANET	TRACK
SPEED	SUPERVISOR	TRADE
SPEND	SUPPLIER	TRADITION

TRAFFIC	USAGE	WISH
TRAIN	USE	WORD
TRANSACTION	USEFUL	WORK
TRANSATLANTIC	USER	WORLD
TRANSFER	USERNAME	WORRY
TRANSITION	USUAL	WORSE
TRANSMITTED	VALID	WORTH
TRANSPARENT	VALUE	WORTHWHILE
TREND	VARY	WRITE
TRIAL	VDX	WRONG
TRIANGLE	VERIFIED	XEROX
TRICKY	VERSION	XML
TRIGGERED	VERSUS	YARDS
TRIVIAL	VIRTUAL	YEAR
TRUST	VISION	YORK
TRY	VISIT	
TUDELFT	VOLUME	
TURNOVER	WAIT	
TUTOR	WALK	
TYPE	WALLET	
UK	WAND	
UMI	WARN	
UNAUTHORISED	WARWICK	
UNCOVER	WARY	
UNDERGRADUATE	WASTED	
UNDERLYING	WATCHING	
UNDERSTAND	WEB	
UNITED	WEEK	
UNIVERSITIES	WELCOME	
UNLIMITED	WESTERN	
UNPOPULAR	WHIZ	
UNREASONABLE	WHOLESALE	
UNREGISTERED	WIDE	
UNRESTRICTED	WIDESPREAD	
UNSATISFACTORY	WIN	
UPDATED	WIRED	
URGENT	WISE	

Appendix D: Sections concerning actor-network theory and co-word analysis: list of prompt words

The following list of 113 words were the most common substantive words in the sections of thesis concerned with actor-network theory and co-word analysis (see Chapter Ten).

ACADEMIC	CRITIQUE	INFORMATION
ACCOUNT	CUT-OFF	INTERNAL
ACTOR-NETWORK	DATA	INTERVIEW
ANALYSIS	DEFINITIONS	KEYWORDS
ANALYTIC	DIAGRAM	LANGUAGE
APPROACH	DISCOURSE	LATOUR
ARTEFACTS	DISTRIBUTION	LAW
ASSOCIATION	DOCUMENT	LEXIMAPPE
AUTHORS	DOMAIN	LIBRARIANS
BENCHMARKING	EMPIRICAL	LINK
BLDSC	ENGINEERING	LITERATURE
CALLON	ENROLLED	MACHINIC
CATEGORY	ENTITIES	MCGREEVY
CHAIN	EVALUATION	MEANING
CITATION	EXPERIMENTAL	METHOD
CLUSTERS	EXPERTISE	METHODOLOGY
COMMERCIAL	EXTERNAL	METRIC
COMMUNICATION	FIELD	MINIMUM
CONTEXT	FIGURE	MODEL
COOCCURRENCE	FREQUENCY	MONARCH
CORE	GLOBAL	NETWORK
CORPUS	INCLUSION	NODES
COURTIAL	INDEX	PERSPECTIVE
CO-WORD	INDUCTIVE	PRACTICES

PRIORI
PROCEDURE
PROCESS
PROGRAMME
PROMPT
PROXIMITY
PUBLISHERS
QUALITATIVE
QUESTION
REALIST
RELATIONSHIPS
REPRESENTATION
RESEARCH
RESEARCHERS
RESULTS
SCHOLARLY
SCIENCE
SCIENTIFIC
SCIENTOMETRIC
SEMANTIC
SEMIOTIC
SINCLAIR
SOCIAL
SOCIOLOGY
SOFTWARE
SSK
STUDY
SUBNETWORK
SYNTHESIS
SYSTEM
TECHNICAL
TECHNOLOGY
TEIL
TEXT
TEXTUAL
THEORY
THRESHOLD
TRANSCRIPTS
TURN
WOOLGAR
WORDS

Appendix E: Sections concerning actor-network theory and co-word analysis: list of prompt words

The following list of 118 words were the most common substantive words in the sections of thesis concerned with social constructivism and discourse analysis (see Chapter Ten).

ACADEMIC	DATA	KNOWLEDGE
ACCOUNT	DEBATE	LANGUAGE
ANALYSIS	DISCOURSE	LATOUR
ANALYSTS	DISCOURSES	LINGUISTIC
ANALYTIC	DISCURSIVE	LITERATURE
APPROACH	ECONOMIC	MANAGEMENT
ARGUMENT	EMPIRICAL	MARXIST
ASHMORE	ETHNOMETHODOLOGY	MATERIAL
ASSERTION	EVIDENCE	MECHANISMS
BATH	EXPLANATION	METHODOLOGICAL
BOUNDARY	FOOTING	MULKAY
CA	FORMAL	PARTICIPANTS
CATEGORY	FOUCAULT	PERSPECTIVE
CDA	FOUNDATIONAL	PINCH
CHAIN	FUNCTIONAL	POLITICAL
CITATION	GRINT	POSITION
CLAIM	IDEA	POSTSTRUCTURALISM
COGNITIVE	INFORMATION	POTTER
COLLINS	INSTITUTIONAL	POWER
COMMUNICATION	INTERACTION	PRACTICE
CONSTRUCTION	INTERACTIVE	PRACTITIONERS
CONTENT	INTEREST	PRIOR
CONTINGENT	INTERPRETATIVE	PROGRAMME
CONVERSATION	INTERVIEW	PSYCHOLOGY
CRITICAL	ISSUE	QUESTION
CRITIQUE	KEY	REALIST

REFLEXIVITY

RELATIVISM

RELATIVIST

REPETOIRE

RESEARCH

RESEARCHERS

RESOURCE

SACKS

SCHEGLOFF

SCHOLARLY

SCIENCE

SCIENTIFIC

SCIENTISTS

SCOT

SOCIAL

SOCIOLOGY

SPEAKER

SPEECH

SPEECHEXCHANGE

SSK

STAKE

STANCE

STRUCTURE

STUDY

SUBJECT

SUBJECTIVITY

SYSTEM

TALK

TECHNICAL

TECHNOLOGY

TEXT

THEORY

THESIS

TOPIC

TRADITION

TRANSITIVITY

UNDERSTANDINGS

WETHERELL

WOOLGAR

WRITERS