METHODOLOGICAL ISSUES IN MANAGEMENT STUDIES: GROUNDED RESEARCH SUPPORTED BY COMPUTER SOFTWARE

Carlos Melo Brito

Faculdade de Ciências Económicas e Empresariais,

Universidade Católica Portuguesa - Centro Regional do Porto

Rua Diogo Botelho, 1327

4150 PORTO PORTUGAL

Umberto Eco's *The Name of the Rose* is a thriller about a series of murders in a medieval monastery. After the suspicious burning of the abbey's library, Brother William of Baskerville, a learned Franciscan, commented on the event with Adso, his young novice assistant:

> "It was the greatest library in Christendom," William said. "Now," he added, "the Antichrist is truly at hand, because no learning will hinder him any more. For that matter, we have seen his face tonight."
> "Whose face?" I asked, dazed.
> "Jorge, I mean. In that face, deformed by hatred of philosophy, I saw for the first time the portrait of the Antichrist, who does not come from the tribe of Judas, as his heralds have it, or from a far country. The Antichrist can be born from piety itself, from excessive love of God or of the truth, as the heretic is born from the saint and the possessed from the seer. Fear prophets, Adso, and those prepared to die for the truth, for as a rule they make many others die with them, often before them, at times instead of them. Jorge did a diabolical thing because he loved his truth so lewdly that he dared anything in order to destroy falsehood. Jorge feared the second book of Aristotle because it perhaps really did teach how to distort the face of every truth, so that we would not become slaves of our ghosts. Perhaps the mission of those who love mankind is to make people laugh at the truth, to make truth laugh, because the only truth lies in learning to free ourselves from insane passion for truth." [Eco, 1983: 491].

The Antichrist who Brother William was referring to was Father Jorge of Burgos, the censor of heretical literature. Father Jorge was convinced that since there was only one single truth, knowledge was something that could not (or should not!) be furthered, only refined. Such a perspective clearly conflicts with the scientific thinking as we conceive it nowadays. As Ackroyd and Hughes (1981: 13) put it, "... scientific thinking has institutionalized the idea that knowledge has to progress and can do so only through research". There is, however, one basic requirement: the researcher must explain and justify how he or she has carried out the study so that the others can confirm or reject his or her conclusions. In other words, the use of an appropriate methodological approach is, to some extent, the seal of guarantee of any scientific work.

In terms of methodology, the use of grounded theory in management studies has gained increased currency. This methodological approach, initially formulated by Glaser and Strauss (1967), consists of a way of developing theory that is ground in data through a continuous and systematic interplay between collection and analysis of data. Moreover, the use of computers in grounded research has proceeded apace over the past few years. In fact, computer software is used to assist researchers not only in shaping their reasoning about data, but also in forming and testing theoretical hypothesis.
Given this interest, the objective of this working paper is twofold. Firstly, it offers an overview on the most relevant literature on this topic. Secondly, it illustrates the application of such a methodological approach to a research project. This concerns a study on the dynamics of industrial systems induced by collective actions for the promotion or defence of groups of interests. The working paper is divided in three sections. The first elaborates on some of the most relevant factors which determined the methodology and research methods adopted in that research project. The section which follows describes and justifies the main strategic research decisions: the choice of the industrial context for the study, and the basic methodological approach adopted. The final section addresses research methods and procedures, both in terms of data collection and data analysis.

DETERMINANTS

The way the research project was conducted depended on a number of factors, each comprising several dimensions, which influenced the basic methodological options. The most important determinants were: (1) the research goals, (2) the content and context of the research project, and (3) a number of constraints that affected the conditions under which the work was developed. The objective of this section is to offer a brief overview of these determinants inasmuch as a more detailed justification of their implications will be addressed by the next sections.

Research Goals

As stated before, the research project aimed at understanding processes of change in industrial systems induced by collective movements. This broad objective was operationalized through two key research questions:

1. ***Why*** and ***how*** do collective actions for the promotion and defence of groups of interests emerge in industrial networks?
2. ***How*** do such collective actions influence the dynamics of industrial networks?

Narrowing down the primary objective to a workable size, a number of methodological decisions flowed directly and indirectly from these research questions. Firstly, they have clarified what the study aimed to understand most and first. Following Mintzberg (1979: 585), no matter "... what our interest, we have always tried to go into organisations with a well-defined focus - to collect specific kinds of data systematically". The definition of research questions specified not only the kind of data to look for, but also the kind of actors to approach. As Miles and Huberman

(1984: 34) put it, the research questions make researchers look "... only at *some* actors in *some* contexts dealing with *some* issues".
In short, the research questions had both data and sampling implications. On the one hand, data collection focused on a limited number of specific issues which stemmed from the content of the research questions: change in industrial systems, collective action phenomena, and groups of interests. On the other hand, the research questions had also obvious sampling decisions since they determined, to some extent, the kind of actors to look at: those who, being involved in collective actions for the promotion or defence of their mutual interests, were likely to collectively affect the process of change in industrial systems.
Furthermore, the methodological decisions were not solely influenced by the content of the research questions. They were also affected by the way such questions were expressed. On the one hand, the two research questions assumed a somewhat broad and unstructured character which called for a methodological approach mainly exploratory in nature. As Strauss and Corbin (1990: 19) put it, if the researcher aim to break new ground in a number of aspects, the methodology should be particularly appropriate "... to uncover and understand what lies behind any phenomenon about which little is yet known". On the other hand, the research questions were formulated in terms of 'why' and 'how' rather than 'who', 'what' or 'where'. This clearly demanded a methodological approach mainly explanatory rather than descriptive. Quoting Yin (1989: 18), "... this is because such questions deal with operational links needing to be traced over time, rather than mere frequency or incidence."

Content and Context of the Research Project

The second major determinant of methodology and research methods had to do with the content and context of the study. The framework for analysis was mainly based on the network approach, a stream of research initially carried out at the Universities of Uppsala and Stockholm and later developed by other research centres mainly in Europe (e.g., Lancaster and Manchester in the United Kingdom, and Lyon in France). For a detailed description of the provenance and basic features of the network approach, see Easton (1992). In this line, the framework for analysis encompassed a number of characteristics which influenced some of the most important methodological decisions. In particular, these were influenced by two basic features: (1) the systemic view adopted, and (2) the interdisciplinary character of the study which stemmed from the interdependence among economic, social and political considerations.
Connectedness is a central characteristic of network studies with significant implications. In fact, methodologies exclusively reliant on statistical inference were, *a priori*, rejected since they usually require independence amongst sampling units. The point is that this requirement cannot be fulfilled by network studies inasmuch as these assume that sampling units are connected and thus interdependent. This characteristic demands methodological approaches that treat the representativeness of samples not in statistical terms. Moreover, the connectedness character of research on networks also affects the choice of the sampling unit. Apparently, such a connectedness character should call for holistic approaches which took as sampling units large networks or even the overall network. However, this option would raise two major difficulties. Firstly, studying a single large network would, in general, be an extremely complex task, if not impossible in most cases. Secondly, it would restrict access to a considerable number of methodologies based on the logic of replication - i.e. "the

logic of treating a series of cases as a series of experiments with each case serving to confirm or disconfirm the hypotheses" (Eisenhardt, 1989: 542). These are the reasons why network studies have usually adopted smaller sampling units such as focal organisations, dyads or small nets. However, this option is not free of problems since the smaller the sampling unit is, the more the connectedness character is lost.

Taking these considerations into account, the choice of the sampling unit for the study was the outcome of a trade-off between two extreme options. On the one hand, the collective character of the research problem did not allow for the use of focal organisations (nor even dyads) as sampling units. On the other hand, adopting the overall network as sampling unit would probably raise a number of difficulties resulting from the complexity of the work and the impossibility of replication. For these reasons, the sampling unit adopted represented an intermediary option between these extreme alternatives. As it will be discussed later, issue-based nets - i.e. nets of relationships amongst actors who are concerned with a particular issue through mutual or conflicting interests - were the sampling units used.

The content and context of the research had also another important methodological implication which stemmed from its interdisciplinary character inasmuch as economic, social and political considerations were strongly overlapped. This raised an important additional issue: how to integrate "... components from different disciplines with the knowledge that they come encumbered by values, meanings and associations that are either ignored, and hence change character, or else remain stubbornly immiscible"? (Easton, 1995: 8). When it comes to methodology, the problems raised by the adoption of an interdisciplinary approach may be less obvious but, nevertheless, they still exist and cannot be neglected. The point is that each stream of research tends to adopt a limited number of methodologies, usually those that are considered to mostly "... match the content and generative process of the theories that they espouse" (Easton, 1995: 8).

Constraints

Finally, methodological decisions were also determined by a number of constraints that affected the conditions under which the study was carried out. One of the most important constraints was time. The research project was administratively limited to a maximum of four years which, given the complexity of the issues under study, became an important element to take into consideration. Moreover, the lack of studies on collective action phenomena developed by the network approach researchers also acted as a constraint.

Nonetheless, such constraints have always assumed a relative nature. For instance, a lack of studies in certain conceptual areas was obviously compensated by further theoretical investigation. But this affected - and was affected by - other constraints such as time. This means that, in practice, a number of trade-offs were made in order to ensure the most efficient use of the resources (time included) during the project.

RESEARCH STRATEGY

The research strategy comprised a number of decisions in respect of two fundamental features of the research project: (1) the selection of the industry studied, (2) the basic methodological approach adopted. The purpose of this section is to describe and justify such choices.

Choice of the Industrial Context

The criteria used for selecting the industrial context were subordinated to two basic requirements. Firstly, the choice of industry was largely driven by the research questions. Secondly, for practical purposes, the industry should not offer significant problems of access and/or confidentiality which jeopardized the viability of the whole project.

The industrial context was provided by the port wine production and trade system. This was selected because it respected, in general, those two requirements. First of all, this industry is characterised by a number of aspects particularly interesting for the study of change in industrial networks induced by mobilisation of interests. The industry is embedded in a mature and well differentiated social structure where power asymmetries play a crucial role in shaping not only individual perceptions and actions, but also the pattern of exchange relationships as well as the overall network structure. The most relevant imbalance stems from the division between the two major interest groups. The first includes tens of thousands of farmers located in the Douro valley in Northeastern Portugal whose main activity is the production of port wine. The second major group is made up of a few dozen shipping-houses mainly dedicated to port trading. They are located some 100 km west of the valley in an urban region near the mouth of the river Douro. Socially, the split is between a rural, provincial and relatively isolated social structure, and a more cosmopolitan, wealthier and better educated elite. In this context, technological changes are relatively unimportant when compared with other forms of change such as the ones caused by disputes and aggregation of interests.

Moreover, the dynamics of the port wine industrial network is not solely influenced by power asymmetries stemming from social imbalances. Its evolution is also driven by political considerations. These are very much the product of a strong state intervention which has for a long time constrained both port production and trade with a severe protective legislation. In fact, since the beginning of the state intervention in the mid-1700s, the relations between the legislative and regulatory powers on one hand, and the network actors on the other, have played a key role in shaping the fortunes of the whole business system.

These two features reflect a basic characteristic of this industry: the non-existence of clear cut boundaries between economic and non-economic exchange relationships. Non-economic exchange relationships - e.g. social and political in nature - overlap, encircle and surround economic exchange relationships. In these circumstances, the port wine industry encompasses a significant number of collective forms of organisation which aggregate actors sharing mutual interests - not only economic but also social and political interests. These forms of association are in most cases the product of attempts by different types of actors to influence the structure and evolution of the overall network in ways that protect and enhance their specific interests. In other words, such organisational structures are means of inducing change or preserving stability.

In sum, the port wine industry offers a wide field of research encompassing a significant number of phenomena related to the emergence, development and influence of collective actions in industrial networks. In other words, this industry provides a good industrial context whose study and analysis is likely to shed light on the issues raised by the research questions.

In addition to the intrinsic features that made the port industry an interesting empirical site for the study of change induced by collective action movements, there was a practical consideration that has also contributed to its choice. Since this industry is a

well-bounded system, it is not difficult to identify who is in and who is out. In fact, despite the existence of several tens of thousands of actors concerned with both the production and the trade of port, the clear geographical boundedness and the severe regulative legislation make, in practice, their identification and characterisation a relatively easy task.

The Case-Oriented Approach

The study followed a typical case-oriented approach. Quoting Easton (1995: 77), this involved "... a small number of social entities or situations about which data [were] collected using multiple sources of data and developing an holistic description as the end result".

The rationale for this methodological option has to do with the exploratory and explanatory character of the study. As mentioned earlier, little was known about the kind of phenomena being studied. The industrial networks theory had so far focused mainly on processes of change induced by economic or technological factors, to the neglect of processes of change involving mobilisation and disputes of interests amongst groups of actors. In this context, the case-oriented approach was used because of its exploratory nature inasmuch as it "... stimulates the development of new substantive theories" (Ragin, 1987: 44) because it "... focuses on understanding the dynamics present within single settings" (Eisenhardt, 1989: 534). The second reason for the choice of such an approach stemmed from its explanatory character. As stressed before, the research questions were formulated in terms of 'why' and 'how' rather than 'who', 'what' or 'where'. And, as Yin (1989) points out, case studies are more appropriate to research questions formulated in terms of 'why' and 'how' because such questions raise issues linked with relational forms which need to be understood over time, rather than mere frequency or incidence.

In terms of sample size, case studies usually involve a small number of units. It may be a sample of one, although in most studies the sample includes multiple cases (cf. Pettigrew, 1988; Easton, Burrell, Rothschild and Shearman, 1993). The study addressed in this working paper was a multiple case research. The justification for this option had not to do with the need to increase statistical representativeness. On the contrary, the study of several cases aimed to improve the capacity to generate theory since it permitted both replication and extension amongst individual cases. Following (Eisenhardt, 1991: 620), replication means that the cases were "... used for independent corroboration of specific propositions. This corroboration helped (...) to perceive patterns more easily and to eliminate chance associations". According to the same author, extension means that the cases were used "... to develop more elaborate theory. Different cases emphasised complementary aspects of the phenomenon [under study]. By piecing together the individual patterns, [one can] (...) draw a more complete theoretical picture" (op. cit.: 620).

The research involved the study of three cases. The choice of the cases was subordinated to the achievement of two objectives. First, to capture the richest data in terms of connectedness, sociality and dynamism of the port wine network. Second, to get the broadest information in terms of scope of the network. Within this frame, the cases studied were:

- *The case of shipments in bulk*. This case had to do with a collective movement undertook by a number of actors involved in port trade which aimed at putting an end to bulk sales of port. The issue was mainly related to the relationships between/among actors involved in the trade and distribution of port.

- *The case of excess stocks*. The second case mainly addressed the relationships between/among actors involved in the production and trade of port. It was related to excess stocks accumulated in the late 1980s, and their negative impact on the strategic position of some groups of actors within the overall port network.

- *The case of the institutional arrangement*. Finally, the third case had a broader character. Since it was related to the re-formulation of the institutional arrangement of the port wine industry, the case involved a particularly large number of different types of actors concerned with the issue - e.g. individuals, firms, trade associations, consortia of firms, informal groups of interests and governmental organisations.

But how have these cases been analysed? And how have data about these cases been collected? Answering these questions is the purpose of the next section.

RESEARCH DESIGN

Having addressed the most relevant determinants of the way the research was carried out as well as the main strategic research decisions, this section elaborates on data collection and data analysis procedures. These were interwoven processes which encompassed both a deductive and an inductive work. This was deductive because "... initial theoretical notions served as guides in the examination of causally relevant similarities and differences. Without theoretical guides, the search for similarities and differences could go on forever" (Ragin, 1987: 45). But, on the other hand, the work was also inductive because the researcher established "... which of the theoretically relevant similarities and differences were operative by examining the empirical cases. In this phase of investigation [it was] (...) formulated a general explanation on the basis of identified similarities" (Ragin, 1987: 45-46). This means that induction culminated in the development of new theoretical insights and concept formulation.
The inductive character flowed directly from the established purpose of generating theory from data. In this regard, the research was mostly reliant on a methodological approach initially formulated by Glaser and Strauss (1967) and termed grounded theory. This is an analytical approach - i.e. "a way of thinking about and conceptualising data" (Strauss and Corbin, 1994: 275) - for developing theory that is ground in data. Under this methodological approach, theory is expected to emerge and evolve through a continuous and systematic interplay between collection and analysis of data based on what Glaser and Strauss call 'constant comparison'. In this line, after an initial collection of data, this was ordered into preliminary 'categories' - i.e. conceptual entities "... that seem to fit the data" (Strauss, 1987: 28) - according to its conceptual context, and then was compared both within and across categories in order to improve consistency and clear boundaries as well as to establish relations amongst

them. Often, additional data was required which means that data collection was not totally dissociated from data analysis.
Nevertheless, for a matter of explicitness this section is divided into two parts. The first is dedicated to data collection: the type of data used, sampling and interviewing. The second part focuses on data analysis with a special emphasis on the coding process and on the software system used for the analysis.

Data Collection

Data. The study was conducted on the basis of multiple sources of evidence. This option was mainly determined by the case-oriented approach adopted. In fact, as mentioned earlier, case research demands an in-depth and comprehensive study of a small number of situations. This calls for the collection of multiple kinds of data since, as Eisenhardt (1989: 538) sustains, "... multiple data collection methods provide stronger substantiation of constructs and hypothesis".
The analysis of the three cases was mainly based on primary data collected through personal interviews where informants were induced to talk about their perceptions of the issues being studied. The reasons for the concentration on individual perceptions were twofold. The first reason flowed directly from the research questions. As stated before, such questions were mainly exploratory and explanatory in nature. They were exploratory mostly because of the lack of knowledge about the kind of phenomena under study: change in industrial networks induced by mobilisation of interests. Research questions were explanatory because, given that they were formulated in terms of 'why' and 'how', they reflected the declared purpose of explaining the importance of collective action phenomena for the understanding of change in industrial networks rather than looking for mere descriptions of facts. Within this context, perceptual data were useful for both understanding the rationale underlying such phenomena and suggesting directly theoretical constructs which could be strengthened by replication and extension. Mintzberg (1979: 587) describes this process in the following way: "For while systematic data creates the foundation for our theories, it is the anecdotal data that enable us to do the building. Theory building seems to require rich description, the richness that comes from anecdote. We uncover all kinds of relationships in out hard data, but it is only through the use of this soft data that we are able to explain them".
The second reason for the concentration on individual perceptions had to do with the partly constructivist position assumed in the research project. According to this perspective, social reality is the product of both individual and social construction which results from the interaction amongst individual actors. This means that the major object of concern was the way actors perceived and interpreted their individual and collective experiences within the systems - e.g. economic, social and political - to which they belonged. Accordingly, instead of treating accounts as objective descriptions, individual perceptions were considered as ways through which respondents structured the systems they were in.
To complement primary data, secondary data was also collected. The justification for its use was also twofold. Firstly, it stemmed from the case-research approach adopted, inasmuch as secondary data provided additional sources of evidence which, allowing for triangulation, were on the basis of a stronger substantiation of new theoretical insights resulting from the analysis of the three cases. Secondly, secondary data proved to be especially relevant to the comprehensive understanding of the industrial context.

Three broad categories of secondary data were used: published data, internal documentation and information provided by industry experts. Published data comprised, essentially, information supplied by books, articles and published interviews. The port wine industry is probably one of the most exhaustively analysed industries. Apart from literature on technical issues (e.g. concerning viticulture and vinification processes) there are dozens of books ranging from general descriptions of the industry to specific fields such as economics, sociology and politics. By way of illustration, four books containing substantive information were published during the short period from mid-1991 to mid-1993. The first (Pereira, 1991) concentrates on the historical evolution from the late 18th century to the early 20th century. This is a period of time considered crucial for the understanding of the existing industrial structure. A few months later, Sotheby's Publications published what is considered the most detailed study ever made (Liddell and Price, 1992) of the estates where port grapes are produced. The third book (Roseira, 1992) assumes mainly a political and social character. It comprises a comprehensive analysis of the Douro region followed by a plan for its development. The author is a member of the Portuguese Socialist Party and a well-known producer who spent years promoting the interests of the growers. Finally, Barreto published in 1993 a well illustrated book where the Douro region is analysed in detail from social, economic, historical and geographical perspectives. The author, a distinguished scholar, politician, and a former Agriculture Minister, is considered one of the most prominent experts in this subject matter.
Data provided by books was especially useful for the general characterisation of the industry, since the specific nature of the three issues studied was not in general analysed by such literature. However, these issues were the subject matter of many articles and interviews published by media. Both Portuguese media (such as the newspapers Público, Jornal de Notícias and Expresso), and magazines in English and French (e.g. Wine & Spirit, Decanter and Revue Vinicole) provided a significant number of pieces about some of the most relevant issues faced by the industry.
Secondary data also encompassed internal documentation, most of it produced by the Port Wine Institute. The bulk of this documentation was made up of statistical data on the evolution of sales and prices. Use was also made of a number of studies carried out by consultants and staff members of the Institute. In addition, industry experts have also provided useful insights. Apart from information experts supplied through media, data was also collected via personal interviews. Six experts in different fields - such as economics, sociology, politics, law and history - were interviewed.

Sampling. When it comes to sampling decisions, the basic criteria to take into account in quantitative research is the statistical representativeness of the sample - i.e. the degree it resembles the whole population in what concerns the characteristics being studied since it should enable researchers to generalise their findings for the entire population. In this research project, these kind of issues were also taken into consideration, albeit in a different way. The basic concern in terms of sampling was the representativeness of concepts rather than the statistical representativeness. In order to achieve such a requirement, it was adopted what Strauss and Corbin (1990) refer to as 'theoretical sampling'. This means that the sample included only as many respondents as it was needed to 'saturate' the categories being studied. According to this principle, respondents were included in the sample inasmuch as the information they were likely to provide was theoretically relevant. According to Strauss and Corbin (1990: 177), "... theoretical relevance indicates that certain concepts are deemed significant because (1) they are repeatedly present or notably absent when

comparing incident after incident, and (2) through the coding procedures they earn the status of categories". It is important to notice the use of the term 'incident' rather than 'person'. As a matter of fact, the primary objective of the study was not to collect people so that a conceptually representative sample could be produced. On the contrary, the interest was in getting information about:

. what people did (or did not) in terms of collective actions;
. the conditions which led to the emergence (or absence) of such collective phenomena;
. how such phenomena evolved over time within and across collective forms of organisation as well as other forms of organisation;
. the consequences and impact of collective actions on the dynamics of industrial networks.

In short, the basic interest of the study was in sample incidents rather than in people *per se*.

Given the basic research method adopted (multiple-case research), the sampling process was carried out at two levels: case and respondent. At the first level, the sample included three units, each of which corresponding to the cases studied. As mentioned earlier, the cases were not chosen randomly inasmuch as random selection was neither necessary nor desirable. On the contrary, the criteria used for selecting the three cases had much to do with the expressed purpose of both replicating situations and extending emergent theory. At the second level, the sampling process involved the selection of the interviewees for each case. Such a selection was based on a snow-balling process from an initial actor - i.e. the researcher attempted to follow connections between actors as if he was following a route made up of bridges linking interdependent islands. The rationale for this method stemmed from the connectedness of industrial networks which demanded that research should be carried out on nets of actors linked by exchange relationships.

The sampling process did not follow a rigid pre-established sampling plan which should be respected in all circumstances. By contrast, it was developed while retaining some degree of flexibility. In other words, sampling was a dynamic process which evolved on the basis of the evolving theoretical relevance of concepts. This reflects two key features of the sampling process adopted. Firstly, sampling and data analysis were overlapping and interwoven tasks with mutual impacts. Secondly, it also reflects the objective of avoiding what is considered one of the most undesirable pitfalls faced by many researchers: the indiscriminate collection of data, and the consequent accumulation of far more information than there will be time to study.

Taking these considerations into account, the process developed in the following way. Firstly, sampling was *a priori* opened to those incidents that were likely to provide the most relevant data about the phenomenon being studied. Secondly, as new categories were discovered and relationships among them were established, sampling became more focused on some incidents in order to uncover or validate such discoveries. Thirdly, some 'peripheral' informants - i.e. people who apparently were not closely linked with the issues under study but whose perceptions about such issues were likely to contribute to new and insightful perspectives - were also deliberately included. In this regard, the experts interviewed were typical 'peripheral' informants. Finally, sampling stopped when 'theoretical saturation' (Strauss and Corbin, 1990: 188) was reached. This means that sampling came to an end when "... (1) no new or relevant data seemed to emerge regarding a category; (2) the category development was dense,

insofar as all of the paradigm elements were accounted for, along with variation and process; (3) the relationships between categories were well established and validated".
A total of fifty-six interviews were carried out. The sample included twelve farmers (one was also director of a wine cooperative), three farmers and bottlers (two were also board members of their respective association), two directors of wine cooperatives, twenty-one directors of shipping-houses (one was also the chairman of a consortium of shippers), and six board members of associations related to the port wine business. Six experts were also interviewed as well as the chairman of the Port Wine Institute, the chairman of the Comissão de Coordenação da Região do Norte (a governmental organisation for the development of the Northern region of Portugal), and two board members of interprofessional bodies of other Portuguese wine regions.

Interviewing and Interview Schedule. Primary data was collected through personal interviews conducted in accordance with a semi-structured schedule. The option for semi-structured interviews was the result of a trade-off between two requirements: the need for flexibility and the importance of structured data. The first requirement had to do with the exploratory character of the study. Since it was important to allow the informants to feel free to develop topics and make points on issues not previously contemplated in the schedule, the interviewing process should not be fully directive. If directed by a rigidly structured guide, respondents would be less likely to handle the interview in the way most appropriate for their reasoning. This would mean that most of the potentially richness of their accounts might be not retrieved. On the other hand, it was important that interviews followed a pre-established schedule. Firstly, to ensure that all the foreseen issues around the research questions could be discussed. Secondly, to ensure interviewees felt relaxed enough to respond in a systematic rather than inconsistent way. Finally, to enable further comparisons among interviews.
Being the product of a trade-off between flexibility and structuredness, the content of the interviews flowed directly from the research questions. In this line, the semi-structured schedule included two main sections. The first aimed at understanding the key issues the interviewee (or his/her organisation) was facing as well as the general background to his or her perceptions, beliefs and actions (or absence of actions). The second section had two objectives, each of which corresponding to the research questions. First, it aimed at discovering whether collective actions (for the promotion or defence of groups of interests) had emerged to cope with the issue(s) previously identified. In addition, this section also aimed at understanding how such actions influenced the dynamics of the industrial network or part of it.
In general, interviews were conducted at the respondents' place of work (if they were members of firms or other organisations) or at home (if the informants were farmers). And quite often, *noblesse oblige*, conversation was 'lubricated' by a glass of port. However, in some few cases, interviews were conducted in less conventional places such as cars - the noise made by people and vehicles outside became then an additional difficulty during the transcription of the interviews.
Interviews usually began by an intentionally short and vague description of the research purposes. Permission for tape-recording was always asked and no respondents objected to it. In any case, promise of complete confidentiality was given, as well as making clear that no assertions made during the conversations would be explicitly attributed to any individual respondent. Some informants asked for a copy of the interview.
Tape-recorded interviews lasted from one to two and a half hours. However, most interviews were preceded (or followed) by long periods of conversation, namely

during lunch time as usual in Portugal. Although these conversations were not recorded, they were very useful because their informal character not only led informants to get relaxed but also permitted me to collect additional data. This data along with other information not retrieved through the semi-structures interviews were later transcribed to a Contact Summary Sheet. These notes and memos were also used as an additional source of data.

Data Analysis

The process of data analysis was largely determined by the case-oriented approach adopted as well as by the qualitative nature of the data collected. Following Eisenhardt (1989), it comprised two basic stages: a within-case analysis and a cross-case analysis. The former was developed separately for each case and entailed two levels of understanding. The first, mainly descriptive in nature, aimed at getting a clear picture of the phenomena under study. The second was mainly exploratory and explanatory in nature. Its purpose was twofold. Firstly, it aimed at getting answers for the research questions: (1) Why and how do collective actions emerge in industrial networks? and (2) How do collective actions influence the dynamics of industrial networks? Secondly, it also aimed at exploring new issues and insights, eventually not contemplated in the framework for analysis.

An important characteristic of this research project is that it was mainly based on words rather than numbers. The idiosyncrasy of words stems from the fact that they tend to be more ambiguous than numbers. Firstly, because the same word may assumed different meanings. For instance, 'trust' (a word often used during the interviews) meant different things depending on the informant. Secondly, the significance of words was frequently dependent on the context - i.e. it became necessary to look backward and forward to other expressions. Finally, sometimes words (or even sets of words) did not express the whole meaning that respondents wanted to convey. For example, the same word followed by a smile was likely to assume a different meaning if followed by a shrug of shoulders. A common solution for the interpretation of qualitative pieces of information is that of coding. A code is a category applied to a word or set of words - most often a sentence or a paragraph - in order to interpret data documents so that new theoretical insights can be generated from them.

In this line, the process of within-case analysis involved the following steps (cf. Richards and Richards, 1990):

. collecting together all the transcripts analysed;
. coding the documents under several categories;
. using codes as a basis for searching topics in segments of text;
. making notes and memos about emerging ideas and theories as the process evolved;
. extending and re-shaping the coding system as understanding and theorising grew;
. and, finally, returning to step 2 and developing the whole process in an interactive way (if and when necessary).

Coupled with within-case analysis, cross-case analysis looked beyond initial impressions and was directed towards the search for common patterns among the cases studied. It involved three basic steps (cf. Ragin, 1987):

. searching for similarities amongst the three cases analysed;
. evaluating whether such similarities were causally relevant to the phenomenon under study;
. formulating general explanations on the basis of the similarities found.

Having provided a general picture of the way data was analysed, the coding process will be described in more detail as well as the data analysis software system used.

Coding. Given that the bulk of the data was in the form of written text and the most relevant pieces of this qualitative data were the transcripts of interviews, coding was the solution adopted for its interpretation and analysis. However, coding was not confined to a mere classification of text pieces. On the contrary, within the grounded theory approach, coding also involved examining, exploring, and theorising about emerging ideas. In short, coding had much to do with catching and interrogating emergent meanings from data.
In this research project the coding system was derived from two basic sources: the theoretical framework and the data itself. The former provided a broad categorisation of codes so that the more specific codes could be generated by the latter. In this context, five basic codes were adopted: <1. Interview>, <2. Actors>, <3. Relationships>, <4. Interpretation of Issues>, and <5. Collective Actions>. These first-level codes were then sub-divided into second-level codes which, in turn, were sub-divided into third-level codes, and so forth. Three systems of codes were used, one for each case studied. In fact, although the theoretical background to the three sets of documents was similar, the final coding systems were distinct inasmuch as these depended on data itself. To illustrate, Table 1 presents the coding tree for the third case studied: the institutional arrangement issue.
The first-level code <1. Interview> aimed simply at characterising the type of interview. It was separated into two sub-categories: <1.1. Interviewee Position> (e.g. director, owner or expert) and <1.2. Type of Organisation> (e.g. shipper, farmer or governmental organisation). The true process of coding had to do with the other four first-level codes. After having a sense of the whole information, the researcher read carefully the documents transcribed, paying special attention to the several topics raised during the interviews. When this step was completed for, say, three to five documents, all the topics were compared and initial connections among them were then established. Sub-categories of the first-level codes were then created, giving rise to an initial hierarchical system of codes.
The process of coding developed in a similar way for the other first-level codes. The code <3. Relationships> was the one which gave rise to the most hierarchical branch of the coding tree. It comprised four second-level codes: <3.1. Type>, <3.2. Reasons>, <3.3. Form>, and <3.4. Content>. The code <3.3. Form>, for example, was then sub-divided into four third-level codes which, in turn, were sub-divided into several fourth-level codes. The process was not of course straightforward. Several documents were coded more than once. Firstly because the process of generating a tree of codes was the outcome of a dynamic process of interpretation of data. As the understanding of the content and structure of the data was extended, further refinements were introduced in the coding system which often required the re-coding of the documents. Secondly, categories were not clearly expressed in the documents. Sometimes sentences were ambiguous, vague or assumed a second (and even a third) sense. This means that some topics regarded as irrelevant at a first glance were later considered important. Moreover, some ideas did not emerge at a first sight. Sometimes, the

TABLE 1
INDEXING TREE:
THE INSTITUTIONAL ARRANGEMENT ISSUE

---

1. INTERVIEW
1.1 Interviewee Position
1.1.1 Director
1.1.2 Chairman
1.1.3 Owner
1.1.4 Manager
1.1.5 Expert

1.2 Type of Organisation
1.2.1 Shipper
1.2.2 Farmer
1.2.3 Farmer and Bottler
1.2.4 Wine Cooperative
1.2.5 Association
1.2.6 Consortium
1.2.7 Governmental Org.
1.2.99 Other

2. ACTORS
2.1 Micro-actor
2.1.1 Farmer
2.1.2 Shipper
2.1.3 Distributor
2.1.4 Farmer and Bottler
2.1.99 Other

2.2 Meso-actor
2.2.1 Cooperative
2.2.2 Gruporto
2.2.3 Groups of Shippers
2.2.99 Other

2.3 Macro-actor
2.3.1 Port Wine Institute
2.3.2 Port Wine Shippers' Ass.
2.3.3 Casa do Douro
(...)
2.3.99 Other

3. RELATIONSHIPS

3.1 Type

3.1.1 Cooperation
3.1.2 Competition
3.1.3 Conflict
3.1.4 Coexistence
3.1.5 Collusion
3.1.99 Other

3.2 Reasons

3.2.1 Profitability
3.2.2 Quality
3.2.3 Defence of Interests
3.2.4 Reduction of Risk
(...)

3.3 Forms

3.3.1 Vertical
3.3.1.1 Farmer-Shipper
3.3.1.2 Farmer-Cooperative
(...)
3.3.2 Horizontal
3.3.2.1 Farmer-Farmer
3.3.2.2 Shipper-Shipper (...)
3.3.3 Translation
(...)
3.3.99 Other

3.4 Content

3.4.1 Coordination
3.4.2 Trust
3.4.3 Personalization
(...)

4. INTERPRETATION OF ISSUES

4.1 Key issues
4.2 Increasing production costs
4.3 Social and economic problems in the Douro valley
(...)

5. COLLECTIVE ACTIONS

5.1 Emergence and Development

5.1.1 Perceptions of the issue
5.1.2 Mobilisation of interests
(...)

5.2 Influence

5.2.1 Impact on individual actors
5.2.2 The multi-level process of interaction
(. . .)

significance of a particular topic only became visible after a broad picture of all topics involved in a particular issue.
In sum, the coding process was not restricted to a process of organising qualitative material so that it could be interpreted and analysed. It was also a largely subjective task since it involved interpretation of data. For this reason some documents were also coded by more than one researcher in order to reach agreement on the essence of the coding process. Despite this precaution, coding was very much the product of an individual interpretative judgement. Under the broad umbrella of the grounded theory approach, the objective of this task was not solely to find connections between/among elements of the data, but also to get explanations. In other words, it was crucial to discover *why* and *how* phenomena happened rather than just to know what phenomena were occurring. Of course, the first step was the establishment of linkages between/among elements through the process of coding and classification. However, this stage was coupled with an in-depth analysis aimed at exploring and explaining the phenomena under study.
As mentioned earlier, this process relied mainly on what Glaser and Strauss (1967) call 'constant comparison' which developed as follows. Apart from the first-level codes adopted *a priori*, the data was first classified in accordance to preliminary categories which were based on their conceptual context. As the process evolved, data was then compared within and across categories already generated. Comparisons within categories aimed at giving them consistency, while comparisons across categories aimed at establishing clear boundaries and connections between/among them. Iterative refinements of categories gave rise to the formulation of concepts forming theoretical hypotheses 'grounded in' the data.

The Software System. Coding and interpretation of data were overlapping processes which consisted of two simultaneous activities: conceptual operations and mechanical tasks. The former were determined by the methodological approach described before. Mechanical tasks, in turn, involved a number of manipulative activities such as locating words (or sets of words) in the documents, marking relevant segments of text, adding comments to these segments, and extracting and assembling conceptually related segments. These operations were carried out with the help of a computing software for qualitative analysis. The software used was NUDIST, a system created by Richards and Lyn Richards, which stands for '**N**on-numerical **U**nstructured **D**ata **I**ndexing, **S**earching and **T**heorising'.
The use of computers in qualitative analysis has proceeded apace over the last few years. Tesch (1990) provided a broad review of first generation packages, followed by a very useful collection of papers edited by Fielding and Lee (1991). More recently, a number of authors have developed serious methodological and practical reflections on the use of computer software in qualitative analysis. Dey (1993) provides a thorough analysis of all the stages involved in qualitative data analysis and how and where computer software can help this process. Weaver and Atkinson (1994) provide a insightful comparison of different software packages and commentary on their adequacy to perform a number of qualitative analysis tasks. Weitzman and Miles (1995) provide thorough descriptions of a broad range of software packages as well as an evaluation of their capabilities and limitations. Kelle (1995) provides an excellent compilation of chapters focusing on the methodological and practical issues facing qualitative researchers who use computer software in their analysis.

The applications of computer-aided software analysis in the field of management studies have been rather scarce. Boje's (1991) ethnographic study of organisational story-telling provides a simple example of the use one software package (THE ETHNOGRAPH) to help code and retrieve text segment. Wolfe et al (1993) lament the scant use of computer aided qualitative analysis in management research and advance some reasons as to why this situation should be remedied.

Most qualitative data analysis software systems merely store textual data and help researchers retrieve parts of it, usually after a coding process. However, all the subsequent theory-building work - e.g. the shaping of understanding and the re-shaping of the data in accordance with the changing understanding - is essentially off-line. NUDIST is different in this respect since it allows researchers to shape their understanding of the data within the computer environment. This is achieved through two basic features. Firstly, NUDIST provides a number of techniques that feed results back into the system rather than taking them out of the system. Secondly, it allows the user to re-organise and re-shape all aspects of the system. In other words, NUDIST is not a simple tool-kit for coding and retrieving data that speeds the routines associated with the handling of primary qualitative data. By contrast, it supports and enhances the central qualitative-analysis techniques of theory emergence by: storing textual documents; coding segments of text; searching for words, phrases, etc.; making notes and memos; re-organising and extending the indexing system as the researcher's understanding and theorising develops.

The choice of a software package to help the qualitative data analysis phase of this project was determined by a number of factors. First, the huge amount of information demanded a powerful tool to code and retrieve large chunks of text. Most software packages provide this basic feature, but not all packages can handle large document databases or complex code labelling. Secondly, it was important to use a software package that supported as closely as possible some of the procedures specified by grounded theory (Glaser and Strauss, 1967; Corbin and Strauss, 1990). As mentioned earlier, one of the key characteristics of grounded theory is its inductive character. The analysis moves from first level categorisation of respondents' answers in their own language, to second level categorisation using the researcher's theoretical categories and language. This move makes a number of demands on analysis software (Araújo, 1995). The analysis software must be able to support the progressive development of categories that, although rounded in the language of respondents, will move closer and closer to the theoretical language of the researcher. As part of this process, the software must ideally support the interplay between the indexing system that categorises the data and the document database. Lastly, the software must be able to allow the researcher to reconstruct the paths taken in the process of categorising data, retrieving categories with segments of text attached and change the categories as a result of successive retrieval operations. In other words, the software must be able to leave an audit trail to the processes the researcher went through to arrive at a final categorisation of the data. NUDIST was the software package that most closely satisfied the above conditions. For more comprehensive descriptions of how the software may be used in practice see Richards and Richards (1991, 1994, 1995) and Araújo (1995). For a recent review of NUDIST see Rodgers (1995) and Lewins (1995).

The development of the NUDIST research project combined three components inside the computer: the on-line data document, a database about these documents, and the indexing database. Outside the computer, the project had two components: the off-line documents and the research team.

NUDIST contains two systems supporting these processes: the Document System and the Indexing System. The former stores textual documents as well as data about them. This allows researchers not only to study and browse on-line and off-line data documents, but also to search the on-line data documents for strings of characters. On the other hand, the Indexing System stores references to both on-line and off-line textual documents. It can contain any number of indexing categories and, in each category, any amount of index references to units of text. Researchers can enter 'by hand' any number of references, browse around the indexing system, change indexing of any document, retrieve any part of documents, build new categories out of old, as well as store any amount of comments at any index category.

NUDIST's structure, comprising both an indexing and document system, provides the user with the possibility of developing a knowledge base related to but relatively autonomous from the document database represented by the interview transcripts. Its flexibility, in terms of allowing a plethora of search and retrieval, created the conditions to refine, extend and prune the indexing system without destroying the links between categories and text. By way of illustration, let us take the example of the bulk issue whose interviews were the first to be coded and analysed. At a first stage, these interviews were coded on the basis of an indexing tree with four basic codes: <1. Interview>, <2. Actors>, <3. Relationships> and <4. Interpretation of Issues>. The code <2. Actors>, for instance, had no subdivisions. In this respect, the only concern was to code segments of text in accordance with the type of actors being found such as <2.1 Port Wine Institute>, <2.2 Farmer>, <2.3 Cooperative>, <2.4 Port Wine Shippers' Association>, and so forth. The aggregation of these codes into second-level codes (<2.1 Micro-actors>, <2.2 Meso-actors> and <2.3 Macro-actors>) came only at a second stage when the understanding about the type of actors involved in this issue was refined. For example, the code <2.1 Micro-actors> became then subdivided into five third-level codes: <2.1.1 Farmer>, <2.1.2 Shipper>, <2.1.3 Distributor>, <2.1.4 Farmer and Bottler>, and <2.1.99 Other>. The reconstruction of this branch of the indexing tree did not require a new coding process. The only thing done was the creation of new second-level codes and the rearrangement of the tree in accordance of these codes. Finally, the comprehensive memo and category labelling facilities provided a useful audit trail of all the operations performed on the indexing system.

The positive features of NUDIST were also weighted against some of its negative features. The user interface in the UNIX version was poor and difficult to get used to. The learning curve for this package is steep and there is always the danger that the software may be over-specified for most qualitative analysis tasks. But, in this case, the extra-power and flexibility afforded by NUDIST compared very favourably with simpler, easier to use but less powerful packages such as THE ETHNOGRAPH.

In summary, NUDIST was not used as a mere tool to code and retrieve segments of text. Rather, it was used to assist the researcher in shaping his reasoning about data, and in forming and testing the theoretical hypotheses. In other words, NUDIST was used as a tool especially designed for researchers who follow a grounded theory approach. However, this does not mean that the tasks of thinking, deciding, judging and interpreting were done by the software. Computers do not perform conceptual decisions. They just help researchers. The main advantage of using such a software was that it made the goals of grounded theory more accessible. Physical data handling would have been much more time-consuming. Consequently, the possibilities of generating theory from data would have been necessarily reduced because of time limitations.

REFERENCES

Ackroyd, S. and Hughes, J. 1981. Data Collection in Context, New York: Longman.

Araújo, L. 1995. Designing and Refining Hierarchical Coding Frames. In Kelle, U. (Ed.), Computer-Aided Qualitative Data Analysis: Theory, Practice and Methods, London: SAGE Publications.

Barreto, António 1993. Douro, Lisboa: Edições Inapa.

Boje, D. 1991. The Storytelling Organization: A Study of the Story Performance in an Office-Supply Firm, Administrative Science Quarterly, 36: 106-126.

Corbin, J. and Strauss, A. 1990. Grounded Theory Method: Procedures, Canons, and Evaluative Criteria, Qualitative Sociology, 13: 3-21.

Dey, I. 1993. Qualitative Data Analysis: A User-Friendly Guide for Social Scientists, London: Routledge.

Easton, G. (1992. Industrial Networks: A Review. In Axelsson, B. and Easton, G. (Eds.), Industrial Networks: A New View of Reality, London: Routledge.

Easton, G. (1995. Methodology and Industrial Networks,. In Moller, K. and Wilson, D. (Eds.), Business Marketing: An Interaction and Network Perspective, Boston, MA: Kluwer Academic Publishers.

Easton, G., Burrell, G., Rothschild, R. and Shearman, C. 1993. Managers and Competition, Oxford: Blackwell Publishers.

Eco, U. 1983. The Name of the Rose, London: Secker & Warburg.

Eisenhardt, K. 1989. Building Theories from Case Study Research, Academy of Management Review, 14 (4): 532-550.

Eisenhardt, K. 1991. Better Stories and Better Constructs: The Case for Rigor and Comparative Logic, Academy of Management Review, 16 (3): 620-627.

Fielding, N. and Lee, R. (Eds.) 1991. Using Computers in Qualitative Research, London: SAGE Publications.

Glaser, B. and Strauss, A. 1967. The Discovery of Grounded Theory, New York: Aldine Publishing Company.

Kelle, U. (Ed.) 1995. Computer-Aided Qualitative Data Analysis: Theory, Methods and Practice, London: SAGE Publications.

Lewins, A. 1995. Nudist Software for Qualitative Data Analysis - A Rejoinder, Management Learning, 26 (3): 370-373.

Liddell, A. and Price, J. 1992. Port Wine Quintas of the Douro, London: Sotheby's Publications.

Miles, M. and Huberman, A. 1984. Qualitative Data Analysis, London: SAGE Publications.

Mintzberg, H. 1979. An Emerging Strategy of 'Direct' Research, Administrative Science Quarterly, 24: 580-589.

Pereira, Gaspar Martins 1991. O Douro e o Vinho do Porto - De Pombal a João Franco, Porto: Edições Afrontamento.

Pettigrew, A. 1988. Longitudinal Field Research on Change: Theory and Practice, paper presented at the National Science Foundation Conference on Longitudinal Research Methods in Organizations, Austin.

Ragin, C. 1987. The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies, Berkeley: University of California Press.

Richards, T. and Richards, L. 1990. Manual for Mainframe NUDIST: A Software for Qualitative Data Analysis on Time-sharing Computers, Melbourne: Replee P/L.

Richards, T. and Richards, L. 1991. The Transformation of Qualitative Method: Computational Paradigms and Research Processes. In Fielding, N. and Lee, R. (Eds.), Using Computers in Qualitative Research, London: SAGE Publications.

Richards, T. and Richards, L. 1994. Using Computers in Qualitative Research. In Denzin, N. and Lincoln, Y. (Eds.), Handbook of Qualitative Research, London: SAGE Publications.

Richards, T. and Richards, L. 1995. Using Hierarchical Categories in Qualitative Data Analysis, in Kelle, U. (Ed.), Computer-Aided Qualitative Data Analysis: Theory, Practice and Methods, London: SAGE Publications.

Rodgers, B. 1995. Nudist Software for Qualitative Data Analysis, Management Learning, 26 (3): 367-370.

Roseira, Luís 1992. Uma Vida pelo Douro, Porto: Edições ASA.

Strauss, A. 1987. Qualitative Analysis for Social Scientists, Cambridge: Cambridge University Press.

Strauss, A. and Corbin, J. 1990. Basics of Qualitative Research, London: SAGE Publications.

Strauss, A. and Corbin, J. 1994. Grounded Theory Methodology: An Overview. In Denzin, N. and Lincoln, Y. (Eds.), Handbook of Qualitative Research, London: SAGE Publications.

Weaver, A. and Atkinson, P. 1994. Microcomputing and Qualitative Data Analysis, Cardiff Papers in Qualitative Research, Avebury, Aldershot.

Weitzman, E. and Miles, R. 1995. Software for Qualitative Data Analysis, London: SAGE Publications.

Yin, R. 1989. Case Study Research: Design and Methods, London: SAGE Publications.