The outside in : questioning the use of electronic information services in organizations
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The Making of ... 
Research design on providers and users

In theory, electronic information services can play an important role in the process of environmental scanning, depending on characteristics of the organization, the organizational environment and the interaction between the two. With Internet as a catalyst, electronic information services are developing towards a better fit with environmental scanning, because of the integration of services, an integration of information flows and an integration of internal and external networks of information sources. This should result in accessible interactivity throughout the entire information value chain. The meta-analysis showed that existing research focuses on how the use of electronic information services can be explained by characteristics of the employed technologies and the individual users, with hardly any attention given to the organizational context.

To take into account the organizational context of both suppliers and users, we will study how both suppliers and users are dealing with the roles electronic information services can play in creating organizational intelligence. This chapter will present our empirical research design among suppliers and users. We will present how we have conducted case studies in organizations and industries to specifically address the organizational context of use. We have used both qualitative and quantitative methods of data collection and analysis. But first, we will introduce our survey among Dutch electronic publishers in which we studied how they try to stimulate the use of their products and services (and thus which factors they perceive as important in influencing the use of electronic information services).

5.1. Studying providers of electronic information services

The use of electronic information services is not only determined by organizational demand but also by (market) supply. Both technological features and editorial content can determine whether people want to use these electronic information services and/or whether they are able to do so. The conduct (behavior) of the providers is an important factor explaining why some people and some organizations consider these services worth the effort and others don't. As we have seen in chapter three, this conduct takes place throughout the entire information value chain. Analysis of this value chain and the supply it generates is therefore necessary.
The main question to be answered by the interviews with electronic publishers is:

What are, according to providers of electronic information services, the main determinants of the use of their products and services and how can factors in the different stages of the information value chain affect usage?

The main purpose of the interviews is to get an insight in how the organization of the information value chain can influence the use of electronic information services. Who are, according to the providers, the (potential) users of their services? What potential values and barriers of media use are important for these users, again according to providers? And finally, how are these ideas about users and usage incorporated in the design, development and support of electronic information services? Which instruments are useful in stimulating usage of these services in organizations?

In order for providers of electronic information services to be included in this research project, they have to apply to the following criteria:

- The computer-based databases they provide are publicly available — that is, everyone should be able to establish their eligibility through subscriptions, membership or other stated qualifications;

- The organizations, for which these databases are meant — the (potential) users, have no direct influence on the content of information, but these users are able to choose their content when they want to; the electronic information services have to be consultation services;

- The contents of the information services concern one of the eleven environmental segments as outlined by Daft (1992);

- The services are directly targeted to the Dutch market; thus only Dutch providers or Dutch representatives/affiliates of international providers are included.

Both commercial publishers and several government agencies, which publish electronic information services for professional markets, participated in this research project. We interviewed 15 representatives of commercial publishing companies and 12 representatives of government information providers.

The interviews were held with managers who perform a liaison function between the internal organization (and thus know about the internal processes in the value chain), and external customers. Since all of the respondents can be considered knowledgeable about the topics discussed, and skilled to express this knowledge, non-standardized treatment is the most appropriate strategy (Leyenaar & Niemöller, 1988). The questions are open-ended, because we do not want to impose our framework on the respondents; we want to get a definition of the situation,
as they perceive it. The interviews were conducted in order to benefit as fully as possible from the strengths of qualitative data, such as:

- a focus on naturally occurring, ordinary events in natural settings;
- local groundedness: a close proximity to a specific situation;
- thick descriptions of the context;
- locating the meanings people place on events, processes and structures; their perceptions, assumptions, prejudgments and presuppositions (Miles & Huberman, 1994).

The topics in the interviews are based on the theoretical frameworks (from chapter two and three) and the meta analyses (of chapter four), including:

- Introduction of respondent and organization;
- Description of services and products;
- Description of the electronic information market, as they perceive it; competitiveness, corporate examples (successes/failures), trends in the supply-side of the market;
- Description of users/customers of their services, in terms of needs (including reasons why the organization has chosen for these market segments);
- Description of usage; perceived barriers of usage and how the provider has tried to lower these barriers
- Ideas about how amount of users and the usage of services can be encouraged; in terms of organizational development at the user's side, market developments, technological developments, improvements in own organization and information value chain.

Several tools as suggested by Miles & Huberman (1994), are used in the analysis of the interviews, such as contact summary sheets and qualitative data matrices. The results of the analysis of interviews among product/marketing managers of electronic publishers are presented in chapter 6. These results were the final prelude to the case studies in organizations at which electronic information services are actually used.
5.2. Case studies of the use of electronic information services

Our research among (non-)users of electronic information services is guided by the general research question:

Which factors determine whether or not electronic information services are used for environmental scanning in organizations?

In other words, why do some people in some organizations use electronic information services in their environmental scanning and other people in the same organizations, or other organizations do no? The individual use of electronic information services is put into an organizational context and organizational use within an environmental context. This means that various levels of analysis are taken into account.

At the environmental level of analysis, we are interested in environmental uncertainty (as perceived by members of an organization), and possible explanations of this uncertainty. At the organizational level of analysis, we focus on organizational structures and business processes. Age and size (and thus lifecycles) of the organization, the distribution of decision-making, the strategic position of the organization, the way boundary spanners are positioned in the organizations (structural position of gatekeepers, and the value-adding processes they are dealing with) are all part of our general conceptual model. Furthermore, we look at management practices concerning information and communication technology, the choice of technologies and the ways they are made accessible. Naturally, some individual characteristics are necessary to complete the conceptual framework. We look at task characteristics - especially external interdependence, functional specialization, hierarchical position, job experience and environmental scanning behavior, demographics (such as age, gender and education), and network literacy, including experience with services and perceptions of accessibility.

In order to examine the validity of our conceptual framework, it is necessary to examine the use of electronic information services in real-life situations. The importance of context - at different levels of analysis - and the consequential breadth of our conceptual framework require the use of various methods for gathering and analyzing data in a more or less integrated fashion. A case study design seems to be the most appropriate strategy.

Yin (1989, p. 13) stresses context and the use of various methods as the two major characteristics of a case study.

A case study is an empirical inquiry that

- Investigates a contemporary phenomenon within its real-life context, especially when
• the boundaries between phenomenon and context are not clearly evident, and in which

• multiple sources of evidence are used.

Yin (1994) argues that both surveys and case studies are appropriate when there is no control over behavioral events (otherwise, experiments can be a more fruitful alternative research strategy) and when the research topic focuses on contemporary events. Both conditions apply in our study on the use of electronic information services. The goal of a survey is mostly static-descriptive; an overview of the degree in which certain opinions, attitudes, motives and behaviors exist within a population, and how these interrelate with various characteristics of the population. (Hendriks Vettehen & Nelissen, 1995). Surveys are thus more suited for descriptive questions as “who”, “what”, “where” and “when”, and less for the explanatory questions as “how” and “why” (see also Yin, 1994). This is especially the case when contextual variables are considered important answers to the how and why questions. Surveys can deal with phenomenon in context but their ability to do so is “extremely limited” (Yin, 1989, p. 18). A case study is especially suited for complex phenomena or broad conceptual frameworks. Surveys concentrate on a relatively large set of units of analysis and (just as experiments) on a limited amount of variables or characteristics (because of the limitations that exist in the possible length of questionnaires). Case studies, on the other hand, focus on a limited set of units of analysis but study a large amount of variables in relation to each other (Peters, 1995). Case studies can combine the best of both quantitative and qualitative research methods; allowing to investigate the organizational context more broadly than possible with surveys, and on the other hand more guided by theory than is the case in most qualitative research.

In other words, case studies require different methods to gather and analyze the data (especially if a case involves different units of analysis), and they require strong theoretical propositions to guide the data gathering and analysis. “In this sense, the case study can be seen as the most structured form of qualitative research, especially in comparison with the qualitative survey, the ethnographic research en the qualitative content analysis” (Peters, 1999).

**Embedded multiple case design**

There are two major design decisions in doing case studies. First, one has to decide whether only one case study will be conducted (as a critical case) or whether more cases will be studied – in a multiple case design. Second, one has to decide on the level of analysis. We have chosen for a multiple case study design with also multiple levels of analysis and we will discuss both choices in this paragraph.

A single case study is subject to several potential biases, such as misjudging the representativeness of a single event and exaggerating the relevance of specific data (Leonard-Barton, 1990). “Multiple cases augment external validity and help guard against observer biases” (Leonard-Barton, 1990). The aim of studying multiple cases is to increase generalizability, in which
an individual’s case’s uniqueness must be reconciled with the need for a more general understanding of generic processes across cases (Miles & Huberman, 1994). In a multiple case design every case serves a “specific purpose with the overall scope of inquiry, for which one has to follow a replication logic: each case must be carefully selected so that it either

1) predicts similar results (literal replication), or

2) produces contrary results for predictable reasons (a theoretical replication).” (Yin, 1989, p. 53).

We have chosen the multiple case design in order to be able to investigate how different conditions (on the basis of which cases are selected) influence different outcomes.

Furthermore, to be able to compare cases they have to be studied in similar matters; it is important that the same variables are used within the different case studies, using similar methods of data collection and analysis, although compromises have to be made. All cases are different, and in every case the research design is altered somewhat to either adjust to specific circumstances or to specific goals. Organizations only provide researchers with access to their employees when they have a say in the design, process and outcomes of the research project. "Fieldwork is permeated with the conflict between what is theoretically desirable on the one hand and what is practically possible on the other (...). In the conflict between the desirable and the possible, the possible always wins" (Buchanan, et al, 1988). One has to show the relevance of the research project to the organization and one has to explicate the efforts required from the organization. Both mostly lead to an adjustment of the research project. Some organizations did not wish to or were unable to put as much effort into the research project as was theoretically desirable; one organization in our case studies did not want to distribute an organization-wide survey because this could send the wrong message to employees about the organization’s intentions with electronic information services. A survey on how people use certain information services, and what they want for the future, could give respondents the wrong impression that the organization is actually able or willing to fulfill these demands. Some organizations alter the research question because they have questions of their own. Some questions are added while others had to be removed because of limited space or time. Furthermore, the use of electronic information services, and especially indirect and intermediate use, is very differently organized in the different organizations. Some have libraries, some don’t. Some have internal networks and some don’t. These different situations require different questions to adjust to the specific organizational context. Altering the research question does compromise the comparability between cases but increases access to relevant organizations. Based on our theoretical framework, we have standardized the questionnaire and the checklist for the interviews as much as possible in order to balance the goals of theory building and testing, with the pragmatic goals of the organizations that are participating in the research project.

Our multiple case study design is further complicated by the fact that within each case different levels of analysis are embedded. This is called an embedded design (Yin, 1994). The important
distinction between the organizational level of analysis and the individual level should be reflected in the research design. It is helpful to distinguish between individuals as respondents and individuals as informants. Simply put, respondents tell about themselves, informants tell about others. When individuals are asked about their own behaviors, perceptions, skills and characteristics, we treat them like respondents. When they are asked about the organization and about how the organization interacts with its environment, we treat them like informants.

When an embedded design is used, "each individual case study may in fact include the collection and analysis of highly quantitative data, including the use of surveys within each case" (Yin, 1989, p.). We have done this as much as possible, to get a representative overview of the present state of affairs concerning the use of electronic information within an organization or within an industry. Also, the use of surveys within cases gives a clear picture on how individual and organizational characteristics relate to each other and to certain kinds of behaviors and attitudes. Furthermore, surveys are very helpful in a multiple case design, because they increase the comparability between organizations. In some organizations, we also held interviews with key informants of the organization. The combination of qualitative and quantitative methods of data collection and analysis can be very helpful in case studies. In cases where both interviews and surveys were held, the interviews mainly dealt with variables on the environmental and the organizational level of analysis. The surveys dealt mostly with variables on the individual level of analysis.

Thus, our case study design can be characterized as an embedded, multiple case study design in which each case (a branch or industry) has at least one sub-level (organizations within an industry) and some have two sub-levels (not only organizations within an industry, but also individuals within an organization). The higher the level of analysis, the more a qualitative research method is used for data collection and analysis. Within each case, individuals are statistically sampled for participation in the surveys. This means that we can generalize the results of the survey to the organization as a whole (when the survey was done with individuals in that organization) or to the industry as a whole (when the survey was done with organizations in a specific industry).

**Sample logic**

The embedded multiple case study design requires clear selection criteria with which cases can be selected, and, within cases, sub-levels of cases. At the highest level of analysis, the cases have distinguishing characteristics of organizational environments. Four industries are chosen as cases. "An industry is a group of competitors producing products or services that compete directly with each other" (Porter, 1990, p. 33). Industries are the appropriate highest level of analysis because organizations within these industries will have more or less the same organizational environment – although perceptions of this environment may vary. A comparison across cases will result in a study of the relative influence of characteristics of organizational environments on the use of electronic information services. The industries are analytically sampled: the selected industries are not representative for all Dutch industries.
Four industries are selected:

1) professional services (especially accountancy, tax consultancy, management consultancy),
2) garment and clothing industry,
3) the hotel and catering industry and
4) news media (a daily newspaper department and a department of a national TV news organization).

These four different cases are supposed to differ from each other in the amount of environmental uncertainty. We would expect bars and restaurants to be positioned in a relatively simple and stable environment. On the other hand, the professional services industries are expected to operate in a complex and unstable environment (see table 5.1.).

<table>
<thead>
<tr>
<th>Environmental Complexity/Change</th>
<th>Simple</th>
<th>Complex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable</td>
<td>Restaurants and Bars</td>
<td>Hotels</td>
</tr>
<tr>
<td></td>
<td>Garment industry</td>
<td>Media industry</td>
</tr>
<tr>
<td>Unstable</td>
<td>Clothing (confection industry)</td>
<td>Professional services industry</td>
</tr>
</tbody>
</table>

Table 5.1. Environmental uncertainty (based on Daft, see also chapter two)

Also, using the categorization of Weggeman (1996) to distinguish knowledge-intensive industries, we can position the different industries at different ends of the theoretical dimensions.

<table>
<thead>
<tr>
<th>Dominant resources</th>
<th>Labor intensive</th>
<th>Knowledge intensive</th>
</tr>
</thead>
<tbody>
<tr>
<td>LM Organization</td>
<td>Hotel and catering industry</td>
<td>Media industry</td>
</tr>
<tr>
<td>KC-organizations</td>
<td>Garment and clothing industry</td>
<td>Professional services</td>
</tr>
</tbody>
</table>

Table 5.2. Market orientation en knowledge intensity, according to Weggeman (1996) (see also chapter two).
The selection of industries is thus based on assumed differences in their environmental uncertainty and knowledge intensity. Whether these differences are in line with the perceptions of respondents in the various organizations remains to be seen. The point here is that we tried to use a theoretical replication logic. We tried to select industries that are expected to be different in their need for environmental scanning.

Within each industry, we selected various organizations. Because of the major differences in how the various industries are organized, we used different selection criteria. In the professional services industry research was done in three organizations – three of the major accountancy/fiscal and management consultancy firms (at that time labeled as The Big Six). In one of the accountancy firms, it was unfortunately impossible to distribute a survey. In the other two firms both organization-wide surveys were conducted and interviews were held with key informants of the organization (see figure 5.2). The individuals within the organizations are statistically sampled to participate in the organization-wide surveys to get a representative overview of individual characteristics, behaviors and perceptions. Some individuals were also selected as informants to have interviews with, for a better insight in the organizational structures and processes and the interaction between organizations and their environments. The informants for the interviews were selected on three different grounds:

- Either they are individuals who are knowledgeable about the external environment of their organization (such as strategic managers and marketing managers); or

- They are responsible for information management in general and/or the management of electronic information services in particular (such as business librarians, information managers and knowledge managers); or

- They have a boundary spanning role in the primary process (senior members of the professional staff – consultants, accountants and fiscal advisors).

This industry is probably the most knowledge-intensive, and some of the organizations in this industry already are implementing knowledge management policies. A close comparison between the organizations within this case is possible. The big six companies are very similar on many dimensions, but each of the three organizations under study implemented different information management policies surrounding the use of electronic information services.

The news media organizations who participated in our research project are not representative of all the news media in the Netherlands, but do play a dominant part in this industry. The same selection mechanisms apply as in the professional services industry. All journalists from the news department of the broadcasting company were selected for the survey, and within the newspaper organization, both journalists and staff members of the holding (management team and support staff such as marketing and EDP) participated. Unfortunately, no freelance journalists or

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In this organization, the research project was combined with a master thesis, conducted by Shenda Alvarez
international correspondents were included, because of organizational difficulties of retrieving them from the personnel databases. Insight in the organizational structures and processes was gathered by informal interviews and participation in daily operations 2.

In the hotel & catering industry and in the garment and confection industry a somewhat different sample strategy was chosen. Because of the low information intensity of the primary processes and the fact that many small organizations exist within these industries, a few end users of electronic information services are expected. It therefore doesn't make much sense to distribute surveys throughout the organization, because for most of the respondents the questionnaire would not be relevant. But, since size and information intensity are both important variables in our conceptual framework, we did want to include them in our research. Therefore, it was decided to draw a statistically representative sample of organizations from the industry and send them a survey on the use of electronic information services in their organization. Within the hotel and catering industry an a-select sample is drawn from the database of the SVH education center. The education center of the textile and clothing industry has a similar database. All organizations within the database received a survey. Both surveys were targeted to general managers of the organization – and they performed as informants of the organization 3.

Methods of data collection and analysis

All cases rely on surveys to get a representative overview of the use of electronic information services within organizations (professional services and news media) or within industries (hotel and catering, garment and clothing). The standardized surveys allow a representative overview within an organization or industry, and close comparison across organizations or industries on mostly individual characteristics and some organizational characteristics. In all cases qualitative research was conducted to get an understanding of the relevant variables on the environmental and organizational levels of analysis. In the cases of the professional services industry this was mostly done through in-depth interviews with key informants. In the other industries, master theses were written on the specific industries, and internships were done to guarantee close contact between the organization and the researchers. In the hotel and catering industry, and the garment and clothing industry, representatives of branch organizations were actively involved in the research project. And in all the organizations of the professional services industry, members of the business information departments (a library, a knowledge center or a marketing department) participated actively as well. These different data gathering methods are used in combination, mainly to stress the point that the user should not be regarded separately from his or her professional and social environment.

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2 Marianne Herbert conducted her internship and wrote her master thesis partly within this research project at the broadcasting organization. Liene Oderwald did the same at the newspaper organization
3 Within the hotel and catering industry, the research project was combined with an internship conducted by Inge Alphenaar, and within the garment and confection industry, the research project was combined with an internship conducted by Manou Brouwer.
The surveys in our research project are mainly meant to give a broad overview, focusing on the frequency in which certain phenomena occur instead of getting insight in the complexity of certain processes. Questions relate more to what, where, when than to how and why (as suggested by Den Hertog & Van Sluys, 1995). Dillman (1978) distinguishes four kinds of information that questionnaires can deal with:

- Attitudes (what people say they want)
- Beliefs (what people think is true)
- Behaviors (what people do)
- Attributes (what people are)

In our surveys, we have roughly made a distinction between attributes of individuals or organizations, behaviors concerning environmental scanning and the use of electronic information services, and perceptions (attitudes and beliefs) of the barriers for use and the usefulness of this use for their own work performance and organizational performance.

The design of the questionnaire was largely in accordance with the guidelines of the Total Design Method of Dillman (1978), and recommendations made by Den Hertog & Van Sluys (1995). In analyzing the different cases, we use a variable-oriented strategy (Miles & Huberman, 1994) in which we present themes that cut across cases. To avoid that specific case dynamics are bypassed we will end chapter seven with short summaries of the main research results per case.

5.3. Conclusion

This chapter dealt with the methodological part of the research project. We have decided to investigate both the supply side and the demand side of electronic information services. With providers of electronic information services we have conducted qualitative interviews to see how they believe they can influence the use of electronic information services. With users we have chosen for an embedded multiple case study design, which is in sharp contrast with most research found in the meta-analysis. The importance of organizational context in explaining the use of electronic information services and the consequential different levels of analysis, are the main rationale behind the research design of embedded multiple case studies.

In the following chapter the results of our research among electronic publishers in the Netherlands will be presented. In chapter seven we will present the results of the case studies to see how users are dealing with electronic information services within their own organizational context.