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### The outside in : questioning the use of electronic information services in organizations

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# Organizational barriers and environmental uncertainty

## The use of electronic information services

### 7.1. Introduction

In theory, electronic information services can play an important role in the process of environmental scanning. The meta-analysis of existing research, however, shows a large gap between the needs of environmental scanning and the use of electronic information services. Existing research focuses on how the use of electronic information services can be explained by technological features and characteristics of the individual users. To close the gap between the needs of environmental scanning and the use of electronic information services, we need to take into account the organizational context of both suppliers and users. Therefore, we have studied how both suppliers and users are dealing with electronic information services in creating organizational intelligence about the external environment. In the previous chapter we concluded that electronic publishers have not benefited optimally from the opportunities that technological developments provide to increase the accessibility and usability of electronic information services. In this chapter we present the results of our user research. We have conducted case studies in various organizations and various industries to specifically address the organizational context of usage.

Our goal is to explore to what degree our theoretical framework is supported in daily practice and to further investigate which conditions hamper or stimulate the role of electronic information services within environmental scanning processes. 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 not? The individual use of electronic information services is put into an organizational context and organizational use within an environmental context.

At the environmental level of analysis, we are interested in environmental uncertainty (as perceived by members of an organization). At the organizational level of analysis, we focus on organizational structures and business processes, such as the distribution of decision-making, the organizational

strategy, the way boundary spanners are positioned in the organizations. 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 behaviour, demographics (especially age, gender and education), and network literacy, including experience with services and perceptions of accessibility.

We have chosen the embedded multiple case study design in order to be able to investigate how different conditions coexist with different outcomes. We will present cases for which we expected a wide variety of environmental uncertainty and usage of electronic information services and organizational capacities (see chapter 5 on research design). Four industries are selected:

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

The selection of industries is based on assumed differences in their environmental uncertainty and knowledge intensity. Within the professional services industry and the news media industry we conducted case studies in several organizations in which large samples of the employees were surveyed. Within the hotel and catering industry and the garment & clothing industry, we only conducted an industry-wide survey.

We will first introduce the various cases that have participated in our research emphasizing the great variety of organizational contexts and shortly discussing the response rates of the quantitative surveys. We will then focus on the main results of the case studies. Our conclusion is that electronic information services play a limited role in the environmental scanning processes of individuals and organizations. We did see a lot of people using these services to some extent (and this will probably be even more so presently) and we also saw a lot of interest in the organization's external environment (and again, this will probably be even more so presently). But, with the exception of the journalists in the media- industry, we did hardly measure a correlation between interest in the external environment and the use of electronic information services. In this chapter, we will not focus on the factual use of electronic information services, because this has probably changed in the last few years with the fast rising of the internet, but we will try to answer the question why there is hardly a relationship between interest in the organization's environment and the use of electronic information services. We will focus on three causes for this lack of relationship:

- 1) In some cases there is not enough variation in the interest in the organization's external environment
- 2) In some cases many use electronic information services despite a relatively low interest in the organization's external environment: they use these services mainly to satisfy an interest in a very specific segment of the organization's external environment
- 3) In some case many do not use electronic information services, despite a relatively high interest in the organization's external environment, because they either use alternatives, experience a lack of accessibility or do not have access to services that satisfies their information needs

Between the cases many differences occur in the importance of these reasons for a limited role of electronic information services in environmental scanning, we will therefore end this chapter with an emphasis on the organizational context by discussing the main results of each case separately.

## **7.2. Introduction of cases**

We have conducted our research on the use of electronic information services within four industries with varying degrees of environmental uncertainty. The professional services industry probably has to deal with the most complex and dynamic organizational environment of the various industries, followed by the media industry.

The professional services industry has long been dominated by the so-called Big Six – internationally leading accountancy, tax and management consultants firms. At the time of the research, all six were still in full operation. Presently, some of these organizations have merged or divested. We have invited three of the original six to participate in our research project. Two of them (labeled 1-of-6 and 2-of-6) were studied in full, with approximately 10 (ten) interviews and a large quantitative survey among a large part of their professional staff. These two cases are more or less comparable. Within the third accountancy/tax & management consultancy firm (3-of-6) we only held interviews with 14 professionals, based on the questionnaire we also send to all the professionals in the other two organizations<sup>1</sup>. 3-of-6 initially intended to participate in the same manner as the other two organizations. Unfortunately, the board of directors did not give permission to do so, because they were afraid the survey could arouse expectations among respondents that could not be met at that moment. This organization did not know yet whether and how they could improve the availability of electronic information services. The other two clearly intended to invest in the availability of services and were eager to know whether their investments had any impact or how it could give any impact.

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<sup>1</sup> This case study was also the main topic of the master thesis of Sherida Alvares who conducted the interviews and did the first analyses.

In 1-of-6 and 2-of-6 the tested questionnaire was largely used as intended: a large-scale survey among the professional staff. In both organizations the survey focused on the information behaviors of individual professionals, how they value external information, their direct and indirect use of electronic information services and the kind of effects they experience from usage. The questionnaires were accompanied with a letter from one of the members of the respective Boards of Directors. Besides these questionnaires, interviews were held with key figures in the organization to get a grip of the organizational characteristics and policies. In both 1-of-6 and 2-of-6 interviews were held with some general managers (in the fields of marketing, ICT and information policies) and professionals (both juniors as well as seniors from the various disciplines – tax, legal, auditing, management consultancy). All interviews were conducted in the same manner as in 3-of-6. The interviews in all three cases of the professional services industry will be mainly used to explain or highlight some of the results of the quantitative survey.

Similar case studies were done in the media industry, although here we also see some alterations because of specific company goals. Two organizations were invited to participate, one is a leading TV news organization, the other a leading newspaper company in the Netherlands. In the TV news organization we have focused on the editorial staff and how they deal with electronic information services within their general newsroom system. This leading TV news organization was planning to implement an updated version of the system, which allows more digital editing and assembling of pictures. The organization wanted to know how (dis-)satisfied the journalists were with the present functions of the newsroom system and what their position was on future updates<sup>2</sup>. In the newspaper company we have done surveys not only with journalists but also with some of the staff units of the holding (IT, marketing services and commercial development, advertising sales and the board of directors). Here, we primarily focused on the use of the internet.

Finally, because of the different character of the horeca and the garment & clothing industries (compared to the media and professional services) and especially the different kind of organizations within these industries, we decided to distribute the questionnaire to the management of a large sample of organizations with the help of industry organizations (SVH, the education center of the horeca industry, and VOC/BETEX, the education center of the garment and clothing industry). Together with the SVH we produced an extensive survey of the entire industry and produced a publication that was presented at their trade conference<sup>3</sup>. Together with VOC/Betex we only conducted the survey. In both industries, we focused on the use of the internet.

### **Response rates**

Considering the reasonable to high responses in the various cases, we believe the individuals within the organizations showed a great interest in the research topic of electronic information services (and probably especially the use of the internet in the organization). Response rates vary from 25% in the garment & clothing industry to 59% of the staff units of the newspaper holding

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<sup>2</sup> The study was conducted together with Marianne Herbert who used these results in her master thesis.

<sup>3</sup> The case study was done together with Inge Alphenaar who wrote her master thesis on this subject.

company (see table 7.1.). Responses also seemed reasonably representative of the entire population of employees of (parts of) an organization, or population of organizations (as was the case within the horeca and the garment & clothing industry). We will discuss the response in a little more detail, to get a better feel of the composition of the various cases.

	Size of sample	Response	Response rate	Interviews
<b>1-of-6</b>	2929	781	27%	9
<b>2-of-6</b>	630	172	27%	6
<b>3-of-6</b>	-	-	-	11-14
<b>Newspaper journalists</b>	272	86	32%	Internship
<b>Newspaper holding</b>	210	123	59%	Internship
<b>TV News</b>	126	51		Internship
<b>Hotel &amp; catering</b>	1350	400	30%	Internship
<b>Garment &amp; clothing</b>	400	100	25%	

Table 7.1. Response rates in the cases

Within the professional services industry, we see a response rate of approximately 27% with a fair representation of the four major business practices in the organizations (see table 7.2).

	1-of-6		2-of-6	
	Population <sup>4</sup> (N=2929)	Response rate : 26.7% (N=781) <sup>5</sup>	Population (N=630)	Response Rate: 27.3% (N=172) <sup>6</sup>
<b>Business Assurance (audit)</b>	1757	440 (25%)	259	55 (21%)
<b>Tax</b>	676	166 (25%)	229	70 (31%)
<b>Management Consultancy</b>	431	162 (38%)	65	20 (31%)
<b>Legal services</b>	65	11 (17%)	77	15 (19%)

Table 7.2. Response in the professional services industry

The response on all known demographic characteristics is representative for the entire professional workforce in both organizations<sup>7</sup>.

Within the cases of the media industry we encountered more problems. The questionnaire to the TV journalists was very long (with 88 questions and 144 variables), because of the double research goals (the use of the electronic newsroom in general and more specifically the electronic information services within it). The journalists had to be personally convinced to fill in the questionnaire. In the end the response was very reasonable (40.5%) but somewhat limited to the

<sup>4</sup> Figures are based on the human resources report of 1996

<sup>5</sup> Another 70 members of the support staff of 1-of-6 (of a total of 876 support employees in the population) have also responded, but we will focus on the professional staff

<sup>6</sup> The business practice of 12 of the 172 respondents of 2-of-6 is unknown.

<sup>7</sup> 32% of all partners in 1-of-6 and 35% of all partners in 2-of-6 have returned the questionnaire. The average age is a little over 32 in 1-of-6 (the same as in the total population) and 30 in 2-of-6 (the average age is 29 in the total population). 81% of the respondents in 1-of-6 is male (compared to 75% in the total population) and in 2-of-6 76% is male (compared to 74% in the total population).

people who worked directly on the newsroom floor. The chief editors did not participate, nor did any of the coordinators (who are in charge of the regular editors). Just a few of the anchormen and the reporters participated (probably due to the fact that especially reporters are often on location) – see table 7.3. The top of the organization is a little bit underrepresented, but in all other demographic characteristics it seems similar to the overall population<sup>8</sup>

<b>Function:</b>	<b>Population (N=126):</b>	<b>Response rate: 40.5% (N=51)</b>
<b>End-editor</b>	11	4
<b>Anchorman/woman</b>	11	1
<b>Editors</b>	51	25
<b>Reporter</b>	12	1
<b>Director</b>	8	4
<b>Director-assistant</b>	15	3
<b>Producer</b>	9	2
<b>Head of Library</b>	1	1
<b>Librarians</b>	7	2
<b>Secretary</b>	1	1
<b>Missing</b>		7

Table 7.3. Response rates of TV News

Compared to the TV news organization it was fairly easy to get high responses from the employees of the newspaper company. In total 482 questionnaires were distributed of which 209 were returned: this is a response rate of 43%, which is very high. Apparently a lot of people wanted their voices to be heard on this subject, as we will see later on. The journalists received the questionnaire at home, because many are often out of the office. Of the 272 distributed questionnaires, 86 were returned (which is a very acceptable response of 32%). In table 7.4. we see how the response is distributed among the several functions among the journalists<sup>9</sup>

<b>Function</b>		
<b>News reporter</b>	27	31 %
<b>Documentary reporter</b>	14	16 %
<b>Editor</b>	18	21 %
<b>Editor internet</b>	8	9 %
<b>Chief editors</b>	10	12 %
<b>Other</b>	9	11 %
<b>Total</b>	86	100 %

Table 7.4. Response rates among the journalists of the newspaper company

The average age of all respondents is 40 years, which is a little higher than in the total workforce (38.5 years) – ranging from 24 to 63 years. On average, people worked an amazing 14 years in this organization (ranging from less than a month to 42 years), but the organization itself was not

<sup>8</sup> 27% of the response is considered managerial, and 73% non-managerial (in the population, 32% is considered managerial). Also, 70% is working as journalists and 30% as supportive. This is quite similar to the real-life situation. Other general characteristics, for which we have no figures for the entire workforce, are: 59% of the respondents is male, 54% of the respondents is a full-time employee, 30% is a free-lancer. The average age is over 37 years, varying from 21 to 54. On average, the respondents have worked with TV News for almost 8 years, varying from 6 weeks to 25 years.

<sup>9</sup> Unfortunately, we are not able to generate response rates per function, because we do not know the distribution of functions in the entire population of the newspaper journalists.

surprised by this result (although we don't have any figures for reference). Especially among the staff members of the newspaper holding company, high response rates were noted. The questionnaires for the holding departments were distributed with internal mail and 59% returned the questionnaires (see table 7.5.).

Department	Population (N=210)	Response rate: 59% (N=123)
Board of directors	4	3 (75%)
Marketing services & commercial development	21	12 (57%)
Advertising sales	71	43 (61%)
IT	79	49 (62%)
Other	35	14 (40%)
Unknown		2
<b>Total</b>	<b>210</b>	<b>123</b>

Table 7.5. Response rates of the staff departments of the newspaper holding company

Finally, in the horeca industry we took a sample of 1350 companies that were associated with the education center (these companies are officially registered to hire interns from various professional schools) out of a total list of 4000 companies. Of these 1350 companies 400 returned the questionnaire, which results in a response rate of 29.6%. The response is not representative for the entire horeca industry, because only companies with a PC took the effort to return the questionnaire. We also have an overrepresentation of large companies and of hotels. In table 7.6. we see the differences between figures of the entire horeca industry, the organizations that are listed in the SVH pool of 4000 companies and the response to our questionnaire. For example, just 37% of the participating organizations in our research have less than 10 employees. This type of organization is much more common in real life: 77% of all horeca organizations have less than 10 employees. So especially the smaller organizations are underrepresented. Also, just 4% of the participating companies are labeled as a café. In the entire industry, café's form 47% of the population. In our research, café's are clearly underrepresented and hotels are clearly over represented.

Amount of employees	Horeca	SVH pool	Response	Type of company	Horeca	SVH pool	Response
<10	77%	50%	37%	Café	47%	14%	4%
10-19	15%	29%	25%	Restaurant	46%	68%	48%
20-49	6%	14%	24%	Hotel	7%	18%	48%
>50	2%	7%	13%				

Table 7.6. Response rates in horeca industry

The response rate in the garment & clothing industry was 25% - 100 returned questionnaires of a total of 400 that were sent – unfortunately we don't have any reference figures to check how representative this response has been.

In all, response rates were reasonably well, with especially top management participating very well especially in the two organizations of the professional services industry (1-of-6, and 2-of-6) and in



the newspaper company. The respondents are fairly representative for the organizations they work in (or in the case of horeca, for the industry in which they work), at least on all known demographic and job characteristics. There will probably be a bias in their interest in electronic information services, but we don't have any evidence of such a bias (although most respondents have a very positive attitude on the effects of these services, as we will see later on).

### 7.3. Model of analysis

Within each case we took the following general model (see figure 7.1.) as a starting point of our statistical analysis.

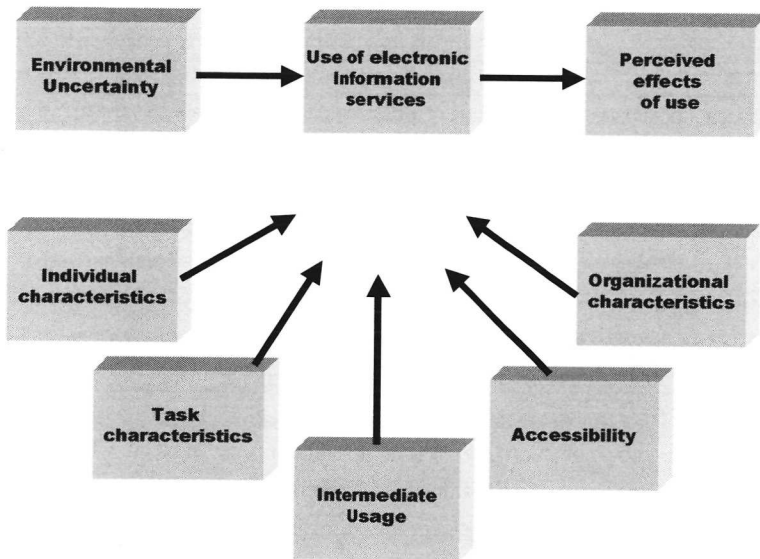


Figure 7.1. Model of analysis

The main theoretical assumption is that the higher the environmental uncertainty, the more organizations (and people in organizations) will use electronic information services. We also expect that the more they use electronic information services, the more impact they perceive on their individual information behaviour and job performance and on the organization as a whole. All other variables are considered possible factors that may influence these general relationships. For example, individual characteristics as age may correlate with the use of electronic information services, or a task characteristic as managerial position may correlate with environmental uncertainty.

In all cases most of these variables are measured comparably, although there are differences in formulation and sometimes different items are added or deleted (see appendix C). We will first discuss the main variables (use of electronic information services and interest in the organization's

external environment) shortly and then discuss the relationships between the two and with the other variables. We will only discuss correlations and differences with a level of significance lower than 1% and – in the case of correlations - with a value higher of 0.20.

#### 7.4. Use of electronic information services

The actual usage figures in the various cases are not very relevant (and have probably increased dramatically since we have measured them). Even during the short time span of the case studies, timing proved to be very influential on the amount of users. The most important conclusion, however, is that the most information- and knowledge intensive industries seem to use the greatest variety of electronic information services and show the highest user rates (taking into account the timing differences).

There is a great variety of electronic information services available within the selected cases, but there is one dominant information service that provides something for everybody and it's called the internet (see table 7.7).

	Type of services
<b>1-of-6</b>	<ul style="list-style-type: none"> <li>• internet</li> <li>• KRC/Library</li> <li>• Wolters Kluwer cd-roms</li> <li>• Lotus Notes mailing lists</li> <li>• Lotus Notes databases</li> <li>• BVI</li> </ul>
<b>2-of-6</b>	<ul style="list-style-type: none"> <li>• internet</li> <li>• Library</li> <li>• Wolters Kluwer CD Roms</li> <li>• Lotus Notes databases</li> <li>• Marketing department</li> </ul>
<b>3-of-6</b>	<ul style="list-style-type: none"> <li>• Dokos Intranet</li> <li>• Library</li> </ul>
<b>Newspaper journalists</b>	<ul style="list-style-type: none"> <li>• internet</li> <li>• Library</li> <li>• News wires</li> </ul>
<b>Newspaper holding</b>	<ul style="list-style-type: none"> <li>• internet</li> <li>• Library</li> </ul>
<b>TV News</b>	<ul style="list-style-type: none"> <li>• internet</li> <li>• Library (with Dutch Press Database)</li> <li>• News wires</li> </ul>
<b>Hotel &amp; Catering (Horeca)</b>	<ul style="list-style-type: none"> <li>• internet</li> <li>• Some other services</li> </ul>
<b>Garment &amp; clothing</b>	<ul style="list-style-type: none"> <li>• internet</li> <li>• Some other services</li> </ul>

Table 7.7. Availability of electronic information services in all cases

In the professional services industry and the media industry we also see some niche databases for specific user groups. The professional services firms use various legal cd-rom's (published by

Wolters Kluwer), the media industry uses the news wires of press agencies such as Reuters and ANP and there are many information services for particular niches in the market. All five organizations in both industries have integrated many electronic information services in their internal networks (either an intranet, a Lotus Notes infrastructure or a newsroom system), although many were cautious with granting employees access to the internet. In all organizations of the professional services industry as well as in the TV news organization, the corporate library plays a dominant role in the selection of information sources, policies on access methods (either stand-alone or integrated, and either access for all or for a limited group of people) and intermediate usage. All libraries have additional information services that are not accessible from the desktop. Within the horeca and garment & clothing industries, the PC is less dominantly present and networks even less so; only the internet seems to be used (see table 7.7).

With so much diversity it is hard to compare the different cases in their use of electronic information services. But let's start with the one common element – the internet.

### **One common element: The internet**

The internet is used throughout every industry and adoption has increased dramatically in the last few years, maybe because it offers something different for everybody, both for work and pleasure.

We suspect that the major differences between the cases can be explained by the timeline in which we studied them and the different environmental context. The most recent surveys in any industry always show higher penetration rates than the earlier research and – taking this into account – the media industry seems to score the highest penetration rate, followed by the professional services industry and last the less information-intensive industries of horeca and garment & clothing (see figure 7.2.). The importance of the timeline is best illustrated with the results of the horeca and the clothing industry. The garment & clothing industry had 49% of the participating companies using the internet. On average, the companies have an experience of 11.7 months, with a median of ten months. This means that more than half of the users in the garment industry did not use the internet at the time of the case study within the horeca case – a year and half before. Therefore, if we would have studied this industry at the same time as the horeca case, we would probably have seen only slightly higher penetration rates.

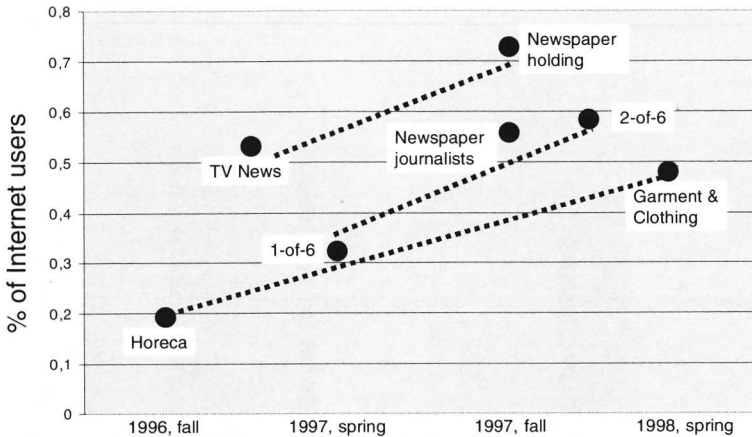


Figure 7.2. Relationship between time of research and percentage of internet users

In terms of frequency, we were able to ask respondents in the media, horeca and garment & clothing industry how many times they used the internet within a specific time period. To be able to compare the results we focus on the percentage of regular users (more than once per week) (see figure 7.3.). We again see that the internet is more frequently used within the media industry, followed by the garment & clothing industry, with the horeca industry ending up last. And, in accordance with the penetration rates, we see that the frequency of internet usage is higher in the most recent surveys and lower in the earlier case studies (internet is more frequently used within the newspaper organization than in the TV news organization and the horeca industry lags the garment & clothing industry).

Within the cases there are some differences between the respondents. At the TV News organization, there are strong differences in the use of internet with the librarians scoring an average of 5.7 (on a scale from 1 (never) to 6 (a few times a day)), the leading journalists 3.2 and the rest of the journalists a mere 1.7<sup>10</sup>. Among the various editorial teams of the newspaper organization, there are also many significant differences. The internet editors use the internet the most frequently (an average of 4.50 on a scale of 0 to 6, it means in this case a little more than once a day), followed by the financial editors (4.29). The special interest editors score the lowest

<sup>10</sup> Kruskal Wallis chi = 9.86\*

average (2.54), although many of the users say the internet is very useful for this topic.<sup>11</sup> The internet editors also surf the web for the highest variety of subjects<sup>12</sup>.

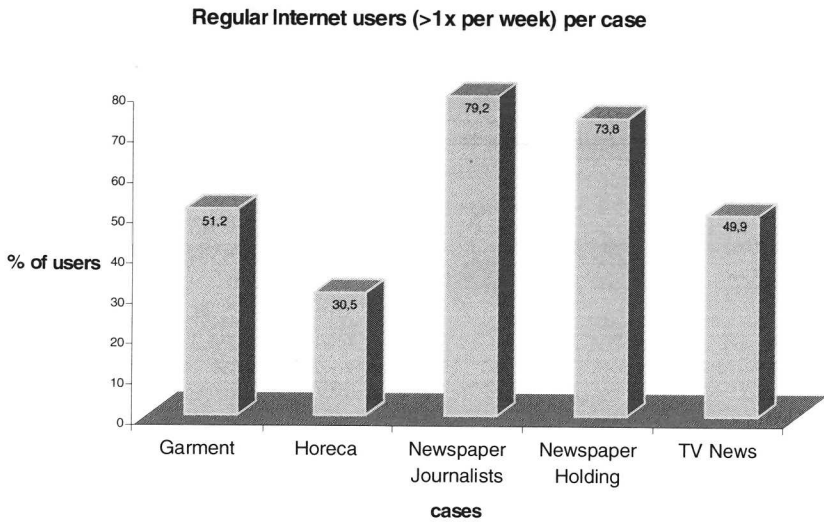


Figure 7.3. Regular internet users in cases

### The importance of niche services in specific markets

Although the internet is the most popular electronic information service (or actually collection of services), there are a lot of other electronic information services available for specific professional groups that seem to be essential for their core business. In the media industry, the journalists especially use the news wires from press agencies such as Reuters and ANP. In the professional services industry, Wolters Kluwer is dominant in providing legal and fiscal information. In 1-of-6, the internal network proves to be useful for e-mail alerting services with an internal interpretation of external developments.

In the media industry, the press agencies are clearly the most popular electronic information services with 98% of the TV journalists and 85% of the newspaper journalists using it (see table 7.8.).

<sup>11</sup> Kruskal Wallis chi = 13.8\*\* for the frequency of internet usage. The same differences (with the same ranking) occur with the amount of time spend on the internet: chi = 13.8\*\*.

<sup>12</sup> Anova F = 4.5\*\* (Levene, p>.05). Post-hoc analysis shows significant differences (\*) between internet editors on the one hand (with an average of 4.5 subjects) and special interest and general news on the other (average of 1.4 and 0.8).

Electronic information services	TV News (N=49)	Newspaper journalists (N=65-85)
Press agencies	98%	85% (N=80)
Volkskrant on cd-rom	63%	n.a.
internet	53%	59% (N=81)
Netherlands Press Database	20%	n.a.
Other services	n.a.	37% (N=85)

Table 7.8. Use of electronic information services among journalists.

The dominance of press agencies is even stronger when one takes the frequency of usage into account. The internet can in no way compete with the lifeline of most TV journalists - the press agencies - which are consulted at least once a day by respectively 85% of the TV journalists (n=48) and 83% of the newspaper journalists (n= 68) (see figure 7.4.).

Use of Internet and Press agencies in TV and Newspaper cases

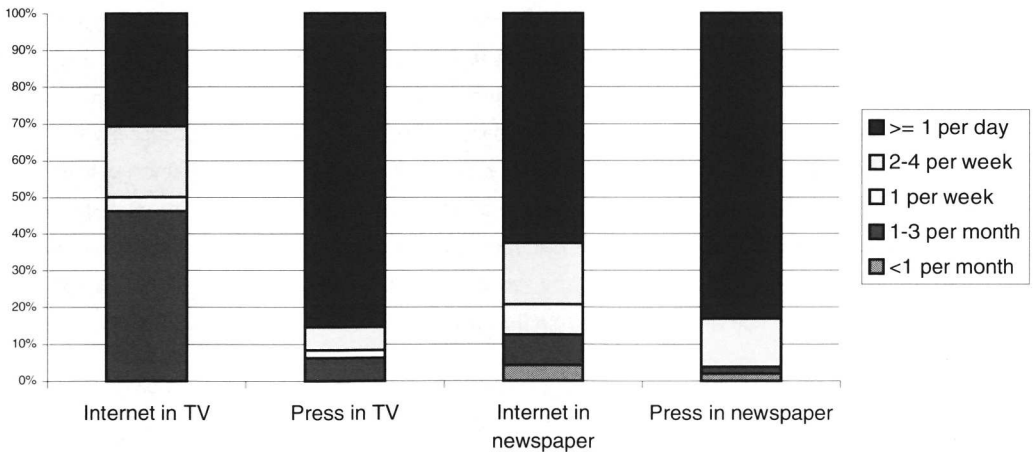


Figure 7.4. Use of internet and press agencies among journalists

Within the professional services industry, the internet is also challenged by other electronic sources of information. internet is the most popular source both in 1-of-6 and 2-of-6 with something for everybody (see table 7.9.). In 1-of-6, it is especially popular among consultants: 60% of them use internet web sites. This percentage is much lower for the auditors (22%) and the tax advisors (25%).<sup>13</sup>

<sup>13</sup> Cramer's V = .35\*\*, Kruskal Wallis chi = 80.6\*\*

<b>Use of electronic information services</b>	<b>1-of-6 (N=628)</b>	<b>2-of-6 (N=171)</b>
<b><i>Market-related information services</i></b>		
internet	33% (1)	58% (1)
Chambers of Commerce online	15% (4)	20% (4)
Small & Medium-sized enterprises (Notes)	12% (5)	n.a.
Financial Daily	12%	3%
Datapro (Notes – ICT)	8%	n.a.
Gartner reports (Notes)	7%	n.a.
Reach	3%	12% (5)
Reuters	n.a.	6%
<b><i>Legal information services</i></b>		
Fiscal Library (WK –tax)	19% (2)	37% (2)
Guidelines annual reports (WK)	17% (3)	6%
VPB (WK-tax)	12%	n.a.
IP/VB (WK – tax)	11%	n.a.
Compendium (WK-audit)	8%	4%
Legal library (WK – legal)	4%	28% (3)
ELEX (WK-European law)	n.a.	8%
BPA	n.a.	6%

Table 7.9. Use of electronic information services in professional services industry

Although the internet is used by the largest percentage of employees, especially for tax and legal advisors the Wolters Kluwer databases seem more important than the internet and other market-oriented information sources. All (100%) of the lawyers and 89% of the tax advisors in 1-of-6 use at least one of the cd-rom's of Wolters Kluwer, compared to just 36% of the auditors<sup>14</sup>. The penetration rates of the Wolters Kluwer cd-rom's among the various disciplines is almost similar in case 2-of-6. Again we see that Wolters Kluwer cd-rom's are very dominant within especially the fiscal and legal consultancy<sup>15</sup>. In terms of frequency, tax advisors in 2-of-6 spend the most of their time on the use of Wolters Kluwer cd-rom's with an average of 1.7 hours a week (a little more than the lawyers). Auditors only spend 0.8 hours per week<sup>16</sup>. There is also a strong relationship between the hierarchical level and the amount of time spend on Wolters Kluwer cd-rom's: the higher the position, the less time one spends ranging from 0.3 hours for partners to 2 hours for assistants<sup>17</sup>.

We see that the specialized cd-rom's are almost exclusively used for the specialized disciplines. The Fiscal library is almost only used by tax advisors, the Legal library by the lawyers and the Guidelines for annual reports by the auditors. For all of them the specific Kluwer databases are a fount of life: "I know a lot of professions, but I don't know many in which developments about legislation, jurisprudence and policies are as dynamic as ours. There's something new everyday on both the national and international level." (tax expert). "The cd -rom's are also used for its archive; I think that with almost every consult report, people use these cd-rom's of Wolters Kluwer to make sure that they interpret a case correctly."(tax expert).

<sup>14</sup> Differences between the disciplines are significant with Kruskal Wallis chi = 50.1\*\*

<sup>15</sup> 100% of all legal advisors and 87% of all tax advisors use at least one of these cd-rom's (versus 37% of all auditors and just 5% of all consultants) in 206. Differences are significant\*\*.

<sup>16</sup> Anova F = 3.6\* with Leven's test p>.05. Post-hoc analysis shows a significant\* difference between tax advisors and auditors

<sup>17</sup> Spearman's Rho = .45\*\* for a re-scaled variable to an ordinal level (to overcome the skewness of the frequency variable on a scale level).

An important difference between 1-of-6 and 2-of-6 has been the use of the internal network Lotus Notes. Within 2-of-6 only 17% use databases on this internal network often to very often. In 1-of-6 only 16% don't use the internal network regularly. Especially the internal e-mail newsletters are very popular. The two expert bureaus who are responsible for the monitoring and distribution of professional knowledge (including legislation and methodology updates) also create a newsletter which they distribute via e-mail throughout the entire organization. This kind of alerting technology is very successful, because these newsletters are the most widely used services within 1-of-6 (more popular than the Wolters Kluwer cd-rom's and the internet). 93% of the auditors and 68% of the tax advisors use the newsletter on audit methodology and knowledge, 97% of the tax advisors use the newsletter on tax legislation, 57% of the auditors and 50% of the tax advisors use the legal notes – which is created by the legal advisors aimed at the rest of the organization. Some external databases (such as Gartner and Datapro) are also made accessible within the interface of the internal Lotus Notes network and these are predominantly used by the consultants<sup>18</sup>

### **Conclusion**

The knowledge intensive organizations seem to be using a little bit more of the internet but the major difference is in the range of services being used and the relative dominance of the internet. Within the horeca and the garment & clothing industry there doesn't seem to be any alternative for the internet and also within staff departments of the news paper holding company, internet is dominant. The professionals of the news and professional services organizations however do also use internet a lot, but they use many other services as well (such as the newswires of the press agencies for journalists, the Wolters Kluwer cd-rom's for (fiscal/) legal advisors). 1-of-6 also uses internal newsletters (distributed via e-mail) to inform professionals on external (legal and fiscal) developments.

### **7.5. The importance of information about the organizational environment**

The organizational environment is omnipresent (see chapter two) and can be something else for everybody. As we will see, almost everybody reports a high interest in the organizational, external environment (or segments of it). Before we go into the relationship between environmental uncertainty and the use of electronic information services, we will first give a short outline of how we measured environmental uncertainty (or interest in the organizational external environment). In nearly all cases environmental uncertainty is operationalized in the same manner, except for the media industry. We will therefore discuss the results in the media industry separately.

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<sup>18</sup> The management consultants predominantly use Gartner (21%), Delivery (18%) and Datapro (15%) – management and ICT related databases. In total, 98% of the tax advisors, 95% of the auditors and 60% of the consultants use Lotus Notes. The differences between the three are significant (Kruskal Wallis chi = 149.3\*\*)



### Interest in environmental segments

In all cases – except for the journalists in the media industry – we have measured environmental uncertainty in the same way. We have asked all respondents to rate on a 4-point scale how important it is for their job to be informed about the various segments of the organizational environment. The 11 (eleven) environmental segments are: legislation, clients, competitors, other industries/suppliers<sup>19</sup>, human resources, financial markets, technology & professional knowledge, management & organization, macro-economic developments, socio-cultural developments and finally international developments. Environmental uncertainty can thus be operationalized as the interest in information per segment, or the amount of segments a respondent rates as important (score 3 or 4) or the average score on all segments or combinations of segments (dimensions of the environment).

The results on the average scores between the various cases are not as different as expected. If we combine all the results, we see that everybody has more or less the same average scores with the managers of the horeca industry the highest scores on interest in environmental segments and the staff members of the newspaper holding having the lowest scores (see table 7.10.).

Within both 1-of-6 and 2-of-6 we see that only with three out of eleven environmental segments a majority of the respondents consider these segments of none or little importance (these items are: macro-economics, socio-cultural trends, human resources). This is only one of eleven segments in the horeca industry and two out of eleven in the garment & clothing industry. Among the staff members of the newspaper holding company, seven out of eleven segments are considered of none or little importance by a majority of the respondents.

	<b>1-of-6 (N=781)</b>	<b>2-of-6 (N=169)</b>	<b>Newspaper holding (N=80)</b>	<b>Horeca (N=396)</b>	<b>Garment &amp; Clothing (N=99)</b>
<b>Clients</b>	3.33 (1)	3.19 (3)	2.69 (3)	3.51 (2)	3.53 (1)
<b>Legislation</b>	3.18 (2)	3.45 (2)		3.52 (1)	3.24 (3)
<b>Industry or Suppliers</b>	3.15 (3)	3.09 (4)	2.36 (5)	3.31 (3)	3.25 (2)
<b>Technology &amp; professional knowledge</b>	3.14 (4)	3.62 (1)	2.91 (1)	3.26 (4)	3.00 (5)
<b>Management &amp; Organization</b>	2.90 (5)		2.53 (4)		
<b>Financial markets</b>		2.83 (5)			
<b>Competitors</b>			2.82 (2)	3.16 (5)	3.14 (4)
<b>Total average</b>	<b>2.85</b>	<b>2.83</b>	<b>2.41</b>	<b>3.06</b>	<b>2.83</b>

Table 7.10. Top 5 segments per case<sup>20</sup>

<sup>19</sup> Within the newspaper holding and the horeca and garment & clothing industry we referred more specifically to suppliers.

<sup>20</sup> Range from 1 (not important) to 4 (very important)

Maybe the most remarkable results of the case study in the horeca and garment & clothing industries with low information intensity is that their managers experience very high interest in the various environmental segments. Also, the high interest in environmental segments in the horeca cannot be strongly linked to the various kinds of companies (in terms of type of company, size, age, pc-infrastructure)<sup>21</sup> and thus seems to exist throughout the industry. The relatively high scores in horeca and the garment and clothing industry need some nuance, because they are somewhat incomparable with the other cases, because in these instances only the general managers were asked. It is probable that not many other people in these organizations have the same interest in these environmental segments. Within the garment & clothing industry we asked for whom the segments are important and 53% states information on these segments is only relevant for 10% of the organization, especially the general manager (91% of the organizations believe so), the sales manager (57%) and the product manager (55%). But for the top of these organizations it is clear that external environments are very important.

The relatively low average scores in the holding company of the newspaper organization can be caused by the fact that these respondents seem to specialize in just one or a few of the environmental segments. The high scores on technology are due to the high response among people from the IT-department. The IT-department is otherwise a lot less interested in the organizational environment than the other three. The IT-department scores a much lower average on overall importance (1.95) than the other three departments (both marketing and sales are 2.7, management is 3.2).<sup>22</sup> As would be suspected from a more or less traditional staff organization of a professional bureaucracy, we also see a strong significant relationship between hierarchy and the relative importance of environmental segments (spearman's rho = .33\*\*).

In chapter 2, we stated that the environmental segments can be grouped into a task environment and a general environment, or a transactional and a contextual environment. In the holding of the newspaper company all segments constitute a homogeneous scale and a one-dimensional factor, so no dimensions can be distinguished<sup>23</sup>. Within the horeca<sup>24</sup> and the garment & clothing industry<sup>25</sup>

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<sup>21</sup> no significant correlations with  $r$  or  $\rho > .25$ .

<sup>22</sup> Anova  $F = 12.9^{**}$  (Levene,  $p > .05$ ). Post-hoc analysis shows significant differences between IT and the other three divisions (\*).

<sup>23</sup> All segments constitute a homogeneous scale:  $\alpha = .91$  and item total correlations are above .46, and one factor explaining 53% of the variance.

<sup>24</sup> Within the horeca industry it was possible to divide the organizational environment into two homogeneous and uni-dimensional factors in congruence with the theoretical distinction. (1) Transactional environment; those segments that have a direct impact on the performance of the organization, such as clients, suppliers, competitors, professional knowledge and international developments. (2) Contextual environment: those segments that have an indirect and managerial impact, such as human resources, macro-economics, financial markets, management & organization, social-cultural trends, legislation and again international developments. All segments constitute a homogeneous scale ( $\alpha = .86$  with item-total correlations  $> .41$ ), with two factors explaining 51.3% of the variance. The factors consist of a transactional environment (clients, suppliers, competitors, professional knowledge and international) and a contextual environment (human resources, international, macro-economic, financial, management & organization, socio-cultural and legislation).

the distinction is as straightforward as theory predicts. In 106 it proved to be impossible to distinguish meaningful dimensions of the organizational environment<sup>26</sup>.

In 206 it is a bit more complicated. Within 2-of-6, we see a distinction between the task environment of consultants (focusing in professional knowledge and client information) and a more general environment (split in a contextual and a transactional environment). With factor analyses, we distinguished four dimensions within their environment<sup>27</sup>:

<b>N=168</b>	<b>Mean</b>
• Professional knowledge (methodology & legislation)	3.54
• Client-focused (clients, industries, management & organization)	2.98
• Contextual information (financial markets, macro-economical info, socio-cultural info, international)	2.61
• Transactional information (competitors, human resources)	2.52

Table 7.11. Environmental dimensions for 2-of-6.

The highest average score is on professional knowledge, followed by client-focused information. The two segments that are primarily important for the organization but not for the professionals (competition and human resources) close the ranking.

All industries but the professional services focus in their own organizational environment on a combination of transactional information (clients, suppliers, competitors) and contextual information (legislation, professional knowledge). The professional services industry (1-of-6 and 2-of-6) is mostly interested in those segments that concern their clients. They are not so much interested in the environment of the organization they belong to (for example: less interest in their competitors), but foremost in those developments that directly influence their advice to clients: legislation, professional knowledge and market information on clients (organizations) and industries.

<sup>25</sup> Within the garment & clothing industry the various segments can be clustered according to the distinction between a transactional and a contextual environment, although in factor analyses three dimensions emerged: (1) Transactional environment: clients, suppliers, technology and legislation, (2) Contextual contact: human resources, competition, financial, (3) Contextual themes: macro-economical, socio-cultural, management & organization. The eleven segments do not constitute a homogeneous scale, because the interest in international news shows low item-total correlations. Without this segment; alpha = .80 and all item-total correlations are higher than .30. Three factors can be distinguished with an explained variance of 60.8%.

<sup>26</sup> Within 106 there are no clear dimensions of environmental uncertainty. Reliability alpha of all segments = .76 and .78 if one deletes legislation (because its item-total correlation is below .30). But in factor analysis, only two dimensions are found with an eigenvalue higher than 1.0, but these two dimensions only explain 47% of the total variance.

<sup>27</sup> All items form a homogeneous scale, but legislation and professional knowledge show very low item-total correlations. So we distinguished two scales: one with professional knowledge (alpha = .65, item-total correlations are higher than .55 and explained variance of the factor is 75.9% with component values of .87) and one with the remaining items (alpha = .79, with item-total correlations above .37). These remaining items form three different factors with a total explained variance of 63.3% (and a straightforward varimax rotation matrix).

In conclusion, in overall average scores, the various industries do not differ much in the importance they place on all the environmental segments. Horeca and garment & clothing managers believe the various environmental segments are very relevant for their organization (but this is probably true for only a few people within the organization). The professional services industry is mainly interested in the external environment if it directly helps the quality of their work towards clients (and not so much the relevance of it for their own organizational strategy) and the staff departments of the newspaper company seem to be the most specialized (with every respondent only interested in just a few of the environmental segments), therefore scoring low total averages.

### **Journalists are a special case**

The importance of external information is self-evident for journalists but unfortunately it is not very useful to use the regular environmental segments as we have used them in other case studies. Journalists do hardly operate in such a corporate environment, but simply use information about the entire society as a source for raw material that serves as input for their production processes. Therefore we had to reformulate the questions on the importance of external information.

Based on McQuail (1997), we used the following measurements of the importance of external information:

- The relative importance of source consultation
- The subjects on which journalists report
- The time pressure of environmental scanning

McQuail (1997) describes news making as the "process of taking notice of an event in the world to writing about it or filming it and process it to a news item for dissemination". The process encompasses source consultation, selection, gathering, processing and dissemination of subjects which provide (according to specific selection criteria) relevant information about the world. McQuail also stresses that news creation is under constant time-pressure and that the time circulation is going faster and faster: news has to be brought as soon as possible to the viewers and readers, sometimes even instantly. The competition on the news market is largely based on who is the first with the news facts (who has the scoop) and who can add interesting facts to the storyline. The very essence of news is its currency and timeliness. Furthermore, competition has forced news organizations to increase their news processing capacity.

Therefore, we first asked the journalists how much of their time they are spending on source consultation. If we exclude the answers from those who said to spend no time at all on source consultation (mainly members of the support and the operational staff), the respondents of the TV news organization spend on average 50% of their time on source consultation (median and mode are the same), varying from 10 to 95%. Naturally there are many differences between the various

functions. Journalists spend 50 to 55% of their time on source consultation. And, within support the librarians are off course heavy users with 80%, and the rest of the direction/production is just 10% (N=30)<sup>28</sup>. In the newspaper company the journalists spend a little less on source consultation or information gathering: on average the journalists spend 31% of their time on con sultation, varying from zero to hundred percent. The median is 25%. One quarter of the journalists spend more than 45% on information gathering.

Secondly, we asked the respondents on what subjects they consulted these sources. The subjects were adjusted to the terminology of the organization. Table 7.12 shows the most popular subjects within the newspaper company:

<b>N=80</b>	<b>Often/very often</b>	<b>Mean</b>
<b>Politics/legislation</b>	28%	2.51 (on a scale from 1 to 5)
<b>Economy/business</b>	26%	2.68
<b>Art/culture/media</b>	18%	2.31
<b>Sports</b>	13%	1.85
<b>Special interest</b>	15%	2.15
<b>Financial markets</b>	18%	1.91
<b>Crime/Police</b>	15%	2.01
<b>Science &amp; Technology</b>	14%	2.20

Table 7.12. The most popular subjects for the newspaper journalists

Most of the items have a very skewed distribution , because most journalists focus on one or two items and score very low on all the others. Further analysis distinguishes two factors:

- Hard news: politics, economy, financial markets, crime
- Soft news: culture, sports, science & technology<sup>29</sup>

We have also asked the relative importance of regional, national and international news. The Newspaper journalists spend on average 21% on regional information (median is 15%), 51% national information (median is 50%) and 26% international (median is 25%). For all three variables the scores range from 0 to 100.

Journalists of the newspaper do not experience a great lack of information. Asking them on which subjects they often feel a lack of information, most of the journalists answer "none of the above" (57% - N=62). The most difficult subjects are economy/business (24%), politics (19%) and sports

<sup>28</sup> Differences between functions are significant with Anova  $F = 5.31^{**}$ , and Levene's test  $p > .05$ . Post-hoc tests are not possible because some groups have less than two cases.

<sup>29</sup> All items but "special interest constitute a reasonable homogeneous scale with  $\alpha = .71$ , but one item-total correlation is below .30. Factor analysis distinguishes two factors which explain 58.1% of the variance.

(16%). The more journalists express a need for hard news the more dissatisfied they are about the sufficiency of information: more subjects are mentioned in which they feel a lack of information<sup>30</sup>.

Within the TV news organization we have focused on a rough distinction in subject and timeliness (again in the terminology of the organization). On average, one spends 40% on foreign news, 35% on national news, 10% on political news and 5% on economical news. Within foreign and national news there seem to be specialists – with a range from 0 to 90% of their information spending time and economic and political news is always a part of the job – with a range from 0 to 30% of the information spending time (N=37). There is a gender difference in content. Male respondents spend most time on foreign news (on average almost 50% compared to 18% of information time of the female respondents) and female respondents spend most time on national news (60% versus 28%)<sup>31</sup>.

In timeliness, current news (of the last 24 hours) constitutes the biggest part of the information time with an average of 40%. Spot news (of the last hour) takes on average 30% of the information time of the respondents. Background information and static information follow with 20 and 12.5%. Again, some respondents tend to specialize because the percentages for spot news, current news and background information vary from 0 to 80%. Spot news seems to be the exclusive territory of the journalists with averages of 35% for the editors and 45% for the leading journalists while on the other hand, the others score 5 to 9%<sup>32</sup>. On the other hand, background information is almost the exclusive territory of the librarians (an average of 50% of their time spend on source consultation) with editors having 20% of their time spend on this kind of information and the top journalists only 11%<sup>33</sup>.

These time constraints make the information flows rather strenuously for some of the employees. Many of the journalists believe that they get too much unimportant information: 44% do (strongly) agree with this statement. Timing is also an issue: 45% (strongly) feel it happens regularly that they get relevant information too late. Only 31% often (strongly) feel a lack of information. Journalists get too much information rather than too little, but timing is essential.<sup>34</sup> Time constraints place a lot of emphasis on spot news for the journalists. Background information is less important or is delegated to the librarians. Also, respondents tend to specialize in either national or foreign news. This will have a clear impact on the use of the various available electronic information services (as we will see later).

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<sup>30</sup> Pearson's  $r = .31^{**}$

<sup>31</sup> Independent samples test gender and foreign news:  $T = -3.94^{**}$  with the assumption of equal variances ( $F=2.5, p>.05$ ). Independent samples test between gender and national news:  $T = 4.18^{**}$  with assumption of unequal variances ( $F=8.0^{**}$ ).

<sup>32</sup> Independent samples test between function (division between journalists and support) and spot news:  $T = -3.06^{**}$  with equal variances assumed ( $F=3.03, p>.05$ ).

<sup>33</sup> Anova  $F = 2.73^*$  (with Levene's test,  $p>.05$ )

<sup>34</sup> The three statements constitute a homogeneous scale ( $\alpha = .71$  with item total correlations  $> .43$ ) and a uni-dimensional factor explaining 63.5% of the variance.

## **7.6. Relationship between organizational environment and usage**

The relationship between the interest in the organization's external environment and the use of electronic information services is rather limited. In paragraph 7.4. we saw that the most knowledge-intensive industries showed the highest user rates and the greatest variety of electronic information services that are used. But these differences cannot be caused by differences in the interest in the organization's external environment, because there is simply not enough variation in environmental uncertainty – total averages are more or less the same for each case, the same segments seem to be considered important in each case.

Within each case we do see some variation among employees in environmental uncertainty and in the use of the available electronic information services. Among the journalists we have found a clear-cut relationship between information interests and the use of the electronic information services. In all other cases the relationship between environmental uncertainty and usage is very limited. We only see some relationships between specific environmental segments and the use of specific electronic information services.

### **The journalists use electronically the information they need**

We asked the journalists how much time they spend on information gathering and source consultation, which subjects they report on and how current the information is they search. On all these topics clear relationships exist with the use of electronic information services.

The more time the newspaper journalists spend on gathering information, the more one uses both the internet and the various press agencies. Also, the frequency of usage of the press agencies increases<sup>35</sup>. We don't see this relationship with the TV journalists, probably because there is not sufficient variation in the time spend on consultation.

There is also a clear relationship between the relative importance of hard news items and the frequency of use of both the internet and the press agencies<sup>36</sup> among the newspaper journalists. The relationship with press agencies is not surprising – this source can mainly be used for hard news. With the internet the story is a bit more ambiguous. The ones with a need for hard news are more likely to use the internet (this relationship cannot be found for soft news). But the most popular subjects among the present users of the internet belong mostly to the category of soft information. The most popular subjects are art/culture/media (64% of all users (N=44) search the web for this subject), economy/business (55%), special interest (55%) and science & technology (55%). internet is something for everybody. Many use the internet for various subjects: 50% of the users surf the Web for three subjects or more.

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<sup>35</sup> Pearson's  $r = .25^*$  for internet usage (dichotomous),  $r = .36^{**}$  for the use of press agencies (dichotomous) and Spearman's  $\rho = .44^{**}$  for usage frequency of press agencies.

<sup>36</sup> Spearman's  $\rho = .30^*$  for relationship between hard news and time spent on the internet (ordinal);  $\rho = .37^*$  for the relationship with usage frequency of press agencies (ordinal).

With the TV journalists we listed different subjects and again we see direct, clear relationships between the importance of these subjects and the use of electronic information services. The use of press agencies is strongly and positively related with the interest in foreign news and strongly, negatively related to the interest in national news. The more one needs national news, the less one uses the press agencies.<sup>37</sup> Apparently the press agencies are mostly used for foreign news, although ANP (one of the press agencies) provides mainly national news. Maybe journalists have many alternative ways to get national news or the national information services do not suffice. The latter is likely because the journalists with a strong emphasis on national news are also the more dissatisfied with the general information supply (too much, too little, too late)<sup>38</sup>. Finally, the interest in economic news is strongly related with the use of the internet.<sup>39</sup>

The use of the various sources of information has also much to do with the demanded timeliness of information. The use of press agencies is directly related with the relative importance of spot news: the more one needs spot news, the more frequently one checks the press agencies<sup>40</sup>. There is a negative relationship with static and background information<sup>41</sup>. There are no clear relationships with internet and timeliness.

#### **In all other cases: low correlations between use and environmental uncertainty**

With very information-intensive professions like journalists, we do see that the sum of various segments shows good relationships with the use of the internet and in their case press agencies. We don't see these relationships with the other cases. For example, the newspaper holding company has the highest internet penetration rate (73%), yet many respondents did not express a strong need for external information. They also have not much contact with the outside world (external interdependence) and they score low on most of the environmental segments except technological developments. Therefore, there are no significant relationships between the need for external information or external interdependence and the use of the internet in the newspaper holding company. We also couldn't find a general relationship between the importance of the organizational environment and the use of electronic information services within 1-of-6. In 2-of-6, we did create four environmental dimensions, but we didn't see strong significant relationships between the interest in the outside world and the use of the various electronic information services.

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<sup>37</sup> Pearson  $r = .56^{**}$  for the relationship between the scale variable press agencies and foreign news, and Pearson  $r = -.58^{**}$  for the relationship with national news.

<sup>38</sup> Pearson's  $r = .46^{**}$ . There is also a strong relationship with foreign news, only reversed: Pearson's  $r = -.36^{**}$  (with the statements on the information supply negatively stated).

<sup>39</sup> Pearson's  $r = .37^*$  for the relationship between internet (dichotomous) and economic news, and Pearson's  $r = .37^*$  for the relationship between economic news and usage frequency of all electronic information services combined (except the two from the press agencies).

<sup>40</sup> Pearson  $r = .34^*$  for the relationship between spot news and the scale-variable use of press agencies (both evn and text wire).

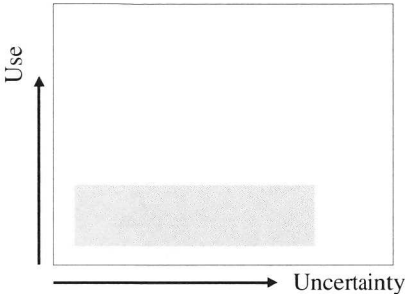
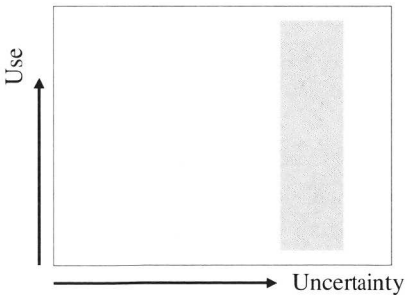
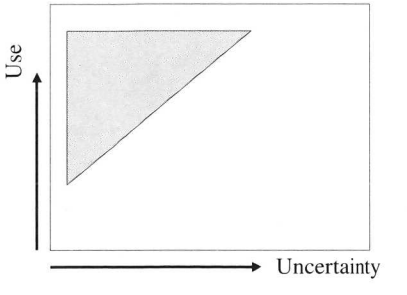
<sup>41</sup> The more one needs static information, the less one uses these press agencies: Pearson  $r = -.40^*$ . The more one needs background information, the less one use press agencies, as measured on an ordinal scale: Spearman's Rho =  $-.42^{**}$



Finally, also in the horeca and the garment & clothing industry there aren't any strong relationships between the interest in environmental segments and the present usage of the internet.

So, in all cases but the journalists', there is no correlation between the individual scores on environmental uncertainty (or dimensions of environmental uncertainty) and the use of electronic information services (such as whether or not they use a specific service, the amount of services they use and the frequency of usage).

There can be various reasons for this lack of relationship between environmental uncertainty and the use of electronic information services:

 <p>A scatter diagram with 'Use' on the vertical axis and 'Uncertainty' on the horizontal axis. A horizontal shaded band is located at a low level on the 'Use' axis, extending across the entire range of 'Uncertainty'.</p>	<p>1. A lack of variation in the use of electronic information services. In this scatter diagram all respondents express low levels of use despite different levels of environmental uncertainty.</p>
 <p>A scatter diagram with 'Use' on the vertical axis and 'Uncertainty' on the horizontal axis. A vertical shaded bar is located at a high level on the 'Uncertainty' axis, extending across the entire range of 'Use'.</p>	<p>2. A lack of variation in the perception of environmental uncertainty. In this scatter diagram all respondents express a similar high amount of environmental uncertainty, although their levels of use vary.</p>
 <p>A scatter diagram with 'Use' on the vertical axis and 'Uncertainty' on the horizontal axis. A shaded triangular area is located in the top-left corner, representing high 'Use' and low 'Uncertainty'.</p>	<p>3. Despite low levels of environmental uncertainty, people are still using electronic information services – this is the case if respondents are predominantly in the highlighted area of this scatter diagram.</p>

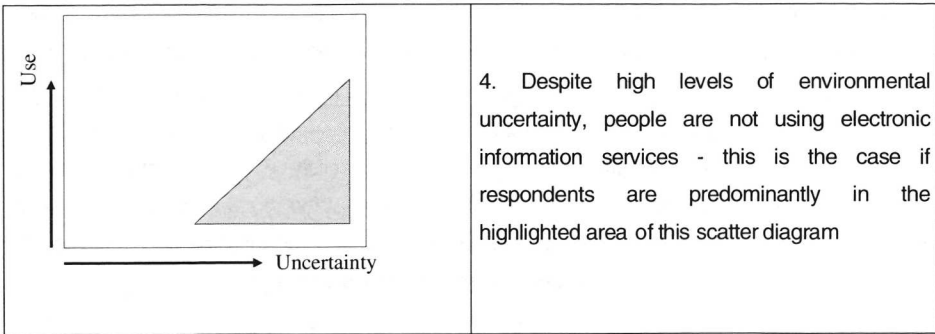


Figure 7.5. Schematic scatter diagrams for the lack of relationship between use and uncertainty

In total we explored the scatter diagrams and box plots of 52 relationships between levels of (dimensions of) environmental uncertainty and use of electronic information services (either use/non-use, or amount of used services, or frequency of use) within 5 cases (1-of-6, 2-of-6, newspaper holding company, horeca, garment & clothing).

In 10 of the 52 instances we predominantly found proof of the first situation; a lack of variation in either the use of electronic information services or the perception of environmental uncertainty. Within 1-of-6, 2-of-6 and the newspaper holding company especially the relationship with frequency of use is hampered by a lack of variation in the amount of times one is using electronic information services; many are limited users. Within the horeca and the garment & clothing industry, there is limited variation in the perceptions of environmental uncertainty which limits a correlation between uncertainty and usage.

In 7 of the 52 instances we predominantly found proof of the second situation; high levels of usage despite relatively low levels of environmental uncertainty. This is probably due to high levels of specialization: high interest in one or two segments but low to moderate interest in the organizational environment as a whole. In the newspaper holding company this is the case in the relationship between environmental uncertainty and the use of internet. For example, the IT – department demonstrated low general need, but high need for technological information and this was for them reason enough to actively search the internet. It appears that especially the IT department wants to use the internet to stay in tune with latest ICT developments and marketing uses it somewhat for occasional environmental scanning. The internet is probably used for different purposes by the various departments, who specialize in only a few segments of the organizational environment. In this case at least, the operationalization of “need for external information” should not be the average of all environmental segments.

There is more proof to the fact that the relationship between environmental uncertainty and usage is distorted by specialization, because there are various correlations between interest in specific environmental segments and the use of specific electronic information services. Within 1-of-6 there are some very strong relationships between the importance of legislative information and the use of

Wolters Kluwer cd-rom's<sup>42</sup>. Also, within 2-of-6 (one of the professional services organizations), the use of electronic sources is strongly linked to the expressed interest in client information<sup>43</sup>. But, there are several respondents who report a low interest in the more client-focused environmental segments but still are using electronic information services. These are people who use electronic information services for a different purpose, specifically satisfying their information needs concerning legislative developments. In short, in the high end of the cases (professional services and staff members of the newspaper company), we only see relationships between specific environmental segments and usage of specific electronic information services.

In most instances and in all cases, however we have seen the reversed situation; in 35 of the 52 examined relationships we see many respondents with little or no use of electronic information services despite the fact that they experience high levels of environmental uncertainty. These respondents do have interest in the organizational environment, but are not using electronic information services to satisfy their information needs. We have asked in several cases to the non-users why they presently did not use any of the electronic information services. The non-users in 1-of-6 and 2-of-6 mainly state they don't use electronic information services because of a lack of awareness. The employees of the newspaper company (both staff members and journalists) mainly blame their non-use on a lack of accessibility. In all cases intermediate usage is a real alternative for some respondents and usefulness is the least expressed reason for not using the electronic information services (see table 7.13.).

In the remaining paragraphs of this chapter we therefore zoom in on the following possible reasons for the fact that many do not use electronic information services despite high levels of environmental uncertainty:

- respondents experience barriers of use, because of a lack of awareness and accessibility,
- respondents use alternative sources for environmental scanning, especially traditional information sources (such as print media) and information intermediaries (such as librarians and colleagues)
- respondents question the usefulness of electronic information services, because these services do not match with their information needs or because they do not expect or experience a positive effect on their work performance.

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<sup>42</sup> For 1-of-6: Correlations between the importance of legislative information and the use of at least one database of Wolters Kluwer:  $\rho = .46^{**}$  and the amount of WK cd-rom's  $\rho = .45^{**}$ . There are also correlations with a few specific databases: the use of the fiscal library (speaman's  $\rho = .42^{**}$ ), the use of IPVP ( $\rho = .23^{**}$ ), and the use of VpB ( $\rho = .23^{**}$ ).

<sup>43</sup> The use of Lotus Notes and external services (measured on a five-point scale) is correlated with various variables that express the interest in client information. For the correlation with the interest in prospect items, Pearson's  $r = .46^{**}$ , with client items  $r = .32^{**}$  and the dimension of organizational environment, labeled client-focused information ( $r = .35^{**}$ ).

	1 of-6 (N=241) <sup>44</sup>	2-of-6 (N=59)	Newspaper journalists (N=42)	Newspaper holding (N=23)
<b>Awareness</b>				
• I don't know these databases	40%	53%	10%	n.t.
• I don't know what's available	56%	n.t.	n.t.	0%
<b>Accessibility</b>				
• Don't know how to get a connection	n.t.	n.t.	36%	4%
• Too expensive	n.t.	n.t.	5%	22%
• Too much time	15%	27%	12%	9%
• Too much effort	8%	5%	7%	9%
• Not the right equipment	11%	n.t.	52%	44%
<b>Alternatives</b>				
• Other sources are better	4%	5%	14%	0%
• Someone else uses for me	19%	29%	10%	22%
<b>Usefulness</b>				
• Not relevant for me	10%	12%	2%	13%

Table 7.13. Reasons for not using electronic information services

### 7.7. Alternatives: traditional sources and intermediate usage

Despite high levels of environmental uncertainty, many respondents do hardly use any of the electronic information services or none at all. We have some proof that some people don't want to use electronic information services because they get their information in another way. First, where measured we have found strong relationships between the importance of the organizational environment and traditional environmental scanning. Second, in several cases intermediate usage is a real alternative for direct use of electronic information services.

Where measured, there is a relationship between the importance of the organizational environment and traditional environmental scanning. Horeca entrepreneurs presently use traditional information sources to scan the environment. The interests in environmental segments correlate nicely with their external communication behavior<sup>45</sup>. Although there is no relationship with present usage of internet, there is a relationship with future expectations. The sooner one expects to start using the internet, the more interest the respondents have demonstrated in both information on the

<sup>44</sup> A large group of users (n=249) also answered this question – probably to explain why they use it a little – and they show almost the same results: 55% of them didn't know their organization had these databases and 44% didn't know these databases. The two relevance statements are at the bottom of the list with 10 and 3%.

<sup>45</sup> External communication behavior is measured as a scale variable consisting of "contact outside company", "foreign contact", "contact other horeca companies", "contact semi-government organizations". alpha = .71 with item-total correlations >.36 (including the "reading of trade magazines" and "reading of magazines of industry organizations", but these form a different factor). The two factors explain 63.2% of the variance. The relationship between external communication behavior and interest in contextual environment shows a correlation of Pearson  $r = .30^{**}$ . The relationship between external communication behavior and interest in transactional environment shows a correlation of  $r = .26^{**}$ . We also see a correlation between the contextual environment and contact within the company:  $r = .27^{**}$ .

contextual environment as well as the transactional environment<sup>46</sup>. The garment and confection industry is also actively using traditional sources of information to scan the environment, with the highest average scores (on a scale from 1 to 5) for employees within the organization (3.34, n=98), trade magazines (3.27), reading material from VOC/Betex (3.04) and other industry organizations (2.99).<sup>47</sup> In both these industries with low knowledge intensity electronic information services apparently do not yet have a position in the environmental scanning process. Respondents stick to the traditional sources. As we will see later, the use of electronic information services in these industries is for the time being more related to capability than to information needs.

But the relationship between the importance of the organizational environment and traditional environmental scanning is not only present within the industries with low knowledge intensity. We have also measured this relationship in the case of 2-of-6 and here we also see that the use of traditional sources is strongly linked to the expressed interest in client information<sup>48</sup>.

In the professional services industry and the media industry there is a real alternative for using electronic information services, that is letting others use electronic information services for you. We will therefore zoom in on the role of intermediate usage in the various cases as an alternative for direct usage.

### **Intermediate usage**

Electronic information services can potentially reach more people by indirect usage: people using the various services on behalf of other people. As we have seen in previous chapters, there has been much debate in the literature on the role of intermediaries and whether it improves the effectiveness and efficiency of the use of electronic information services. From some of our cases we conclude that intermediate usage can be a real alternative for reducing environmental uncertainty. But, the impact of intermediate usage is limited. It is considered fruitful when the information behavior is not closely linked to the primary process and tasks. Also, indirect usage is directly linked to hierarchy. The higher in the organization, the more others are asked to do some searches. The role of information professionals and corporate libraries is very small, because colleagues are the most popular as information intermediaries.

Intermediate usage refers to asking someone else to actually use the electronic information services to find some information; the user of the information is not the same person as the user of the information service. Often one thinks of information professionals and librarians as the intermediaries, but often also direct colleagues are asked.

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<sup>46</sup> Spearman's Rho = .27\*\* for the relationship between expectancy to use and the interest in contextual environment. Spearman's rho = .26\*\* for the relationship between expectancy and the interest in the transactional environment.

<sup>47</sup> the various sources do not constitute a meaningful scale variable.

<sup>48</sup> Correlations between the use of the traditional sources (newspapers/ magazines and personal sources such as colleagues, clients and other organizations) and an interest in the client items (Pearson  $r = .46^{**}$ ), the prospect items ( $r = .37^{**}$ ), client-focused information (Pearson  $r = .38^{**}$ ) and contextual information ( $r = .29^{**}$ )

Intermediate usage frequently occurs in all organizations, but there is much variety in the popularity of intermediate usage among the different cases. In 1-of-6 and 2-of-6 we have asked the non-users why they presently are not using the various electronic information services. 19% of the non-users in 1-of-6 (N=241) answered that someone else is using these services on their behalf. Especially partners gave this reason for not using electronic information services: 45% of the partners say so and this percentage is only 9% for the junior & senior advisors<sup>49</sup>. In 2-of-6 these percentages are even higher: 29% say that intermediate usage is the reason they are presently not using any service themselves and all (100%) of the non-using partners have given this reason. Among the staff members of the newspaper holding, 22% say they don't use any of the services because they delegate it to somebody else.

Intermediate usage is most popular in 2-of-6 and in the TV News organizations and a lot less so in 1-of-6 and the newspaper company. Within 2-of-6 and the TV news organization over 60% of the respondents ask others to search for them. In the other organizations this figure drops to approximately 30% of all respondents (see in figure 7.6, the percentages refer to the combination of "only intermediate" and "intermediate & direct").

Within 3-of-6 intermediate usage also wasn't common practice among the 14 interviewees. Five seldom ask others to search the intranet, and another two never do so. One of them says the intranet does not contain relevant information, the other says he gets the results faster by doing it himself. "It is just a matter of clicking the icon and typing the keyword. It is really senseless to delegate it", or as another one put it "because it is so easy, I would rather do it myself. By the time I have asked someone, I have already the results on my screen."

Only in the newspaper company we do see a large number of respondents who only come in contact with electronic information services through intermediate usage (figure 7.6. shows the percentage of respondents with only intermediate usage). Also, in the newspaper company intermediate usage is an alternative for some of the beginning or less experienced users, because there are significant relationships between intermediate usage and the experience with internet<sup>50</sup> and the frequency of usage<sup>51</sup>.

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<sup>49</sup> Cramer's V = .32\*\*

<sup>50</sup> Spearman's rho = -.31\* for the relationship between internet experience and asking others among the newspaper journalists.

<sup>51</sup> Spearman's rho = -.38\*\* for staff members and Spearman's rho = -.53\*\* for the newspaper journalists.

### Intermediate use popular at 206 and TV News

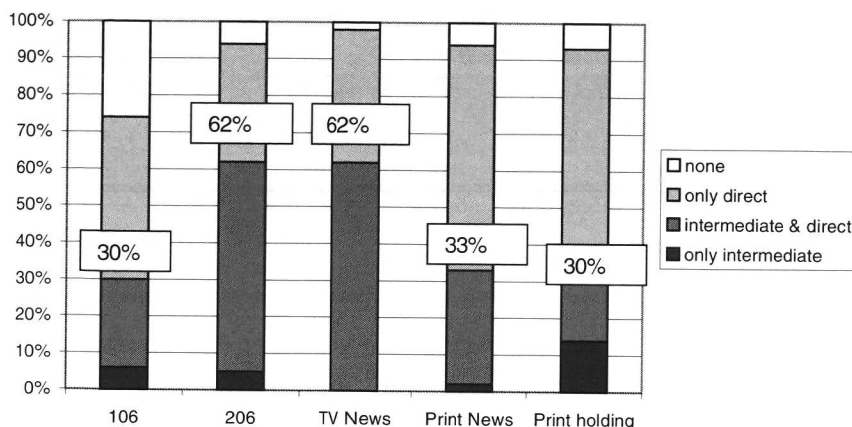


Figure 7.6. Intermediate usage and/or direct usage in different cases

The combination of intermediate and direct usage is slightly related to the amount of interest in the organization's external environment in the professional services industries. That is, the more interest one has in the environment, the more one uses electronic information services (either directly or indirectly).. Within 1-of-6 the relationship is the strongest with non-users scoring an average of 2.60 on environmental uncertainty (from a range from 1 to 4) and people who use electronic information services both directly and through intermediaries scoring an average of 2.92:

- non-users: the ones who don't use at all 2.60
- only intermediate: the ones who only use through intermediaries 2.88
- only direct: the ones who only use directly 2.80
- intermediate & direct: the ones who do both 2.92

These differences in average scores are significant, especially the differences between the non-users and the other three types of users. Non-users experience significantly lower levels of environmental uncertainty.<sup>52</sup> Within 2-of-6, this is true for a segment of the users<sup>53</sup>..

<sup>52</sup> Anova F = 11.88\*\* for the differences on the average score on all environmental segments between the four groups. In a post-hoc test, the non-users differ significantly (p<.01) with the ones who only use directly and the ones who use both directly and through intermediaries. The same is true for the differences on the amount of important environmental segments (with a score of 3 or 4); Anova F = 9.32\*\*. The non-users on average list 6.4 segment as (reasonably or very) important, compared to 7.1 for the direct users and 7.6 for the ones who use both directly and indirectly.

The alternative of intermediate usage is especially available for the higher management layers in these organizations. We already saw that many partners in 1-of-6 and 2-of-6 say they do not use electronic information services themselves because they let someone else search for them. In both organizations, another strong relationship between hierarchy and intermediate usage exists. About 45% of all partner/directors in 1-of-6 let others do the searching, compared to 18% of all juniors<sup>54</sup> (see also table 7.14.) and the average amount of times partners do so is also significantly higher<sup>55</sup>. Combining both direct and indirect use of electronic information services, only 22% of all partners do not come in contact with electronic information services and this percentage increases down the hierarchy to 30% of all assistants. In the interviews most respondents of 1-of-6 argued that intermediate usage was preferable for some people (especially managers and partners) because of a lack of time and expertise or regularity in use. "I do not benefit optimally from the various databases, because I don't have any time to dive into these databases... but I am also lazy, because I ask others to do so and often they come up with some nice stuff, so apparently it works, but I have no idea how much terrible effort they had to put into it... Furthermore, I am just not capable of asking the right questions, but experienced users do know this" (consultant manager). A tax manager says "all electronic information services are used indirectly, even juniors hardly use them. It takes too much time, and you only use them once and again."

<b>1-of-6</b>	<b>partner (N=68)</b>	<b>manager (N=145)</b>	<b>senior (N=220)</b>	<b>assistant (N=301)</b>
<b>None</b>	22%	17%	31%	30%
<b>Only Indirect</b>	10%	13%	4%	3%
<b>Only Direct</b>	32%	38%	37%	53%
<b>Both</b>	35%	32%	28%	15%

Table 7.14. Direct and/or intermediate usage by different hierarchical levels in 1-of-6.

These hierarchical differences are even more apparent in 2-of-6. Through the combination of direct and intermediate usage, all partners (100%) do come in contact with electronic information services (see table 7.15.). There are strong relationships between hierarchy and the intermediate usage of

<sup>53</sup> Concerning the use of the Wolters Kluwer cd-rom's, the four groups differ significantly in both their need for prospect information as well as their need for professional knowledge (mainly legislative information). Anova  $F=22.62^{**}$  for the differences on the average score of the need for professional knowledge between the four groups of Wolters Kluwer users. Especially the non-users show significantly less interest in professional knowledge compared to the direct users and the ones who use Wolters Kluwer both directly and indirectly, according to the post-hoc test. Anova  $F = 8.76^{**}$  for the differences on the average score on the need for prospect information. According to the post-hoc test, the ones who only use Wolters Kluwer directly show significantly less interest in prospect information than the two groups who use intermediaries.

Concerning the use of the market-related electronic information services, the differences between the various groups are not as clear-cut and we only see significant differences between the four groups in their need for prospect information. Anova  $F= 8.47^{**}$  for the differences on the average score on the need for prospect information with especially a significant difference between the non-users and the ones who use electronic information services both directly and indirectly

<sup>54</sup> Kruskal Wallis chi = 32.6\*\*

<sup>55</sup> Kruskal Wallis chi = 10.4\*\*



both Wolters Kluwer cd-rom's<sup>56</sup> and the market-related electronic information services, including internet<sup>57</sup>. Partners ask on average 6.7 times a month, compared to 2.3 times a month for assistants<sup>58</sup>.

<b>2-of-6</b>	<b>partner (N=11)</b>	<b>manager (N=37)</b>	<b>senior (N=40)</b>	<b>Assistant (N=68)</b>
<b>None</b>	0%	3%	5%	9%
<b>Only Indirect</b>	9%	19%	3%	0%
<b>Only Direct</b>	0%	3%	8%	57%
<b>Both</b>	91%	76%	75%	34%

Table 7.15. Direct and/or intermediate usage by different hierarchical levels in 2-of-6.

Finally, within the TV news organization we also see that hierarchy seems to influence the intermediate use of electronic information services. There is a relationship between age and asking others to do some research (Spearman's rho = .33\*), which would suggest that hierarchy has something to do with it<sup>59</sup>.

So, because of the alternative of intermediate usage, more partners come into contact with information from these various services than any of the other hierarchical levels. But the role of the information professionals and corporate librarians is limited. Intermediate usage is mostly performed by junior colleagues instead of professional intermediaries. Professional intermediaries are only asked when the information search is not closely related to the primary process of the respondents.

If one asks others to search the intranet, it is most often asked to someone lower in the hierarchy, like a junior or senior assistant or trainees. Just one of the interviewees in 3-of-6 asks the IRC to do the search. Another interviewee explains that normally a team is working on an assignment which means that sometimes one of the team members is asked to do the information search for all of the team members; most often this is one of the assistants. One senior however does search for the assistants, because in his field of expertise – tax consultancy – he states that the search interface is not user-friendly and you need some domain knowledge to find the right keywords. He is truly the exception.

<sup>56</sup> 82% of the partners asks others to do an information search on Wolters KluwerCD's, compared to 78% of the managers, 67% of the seniors and only 22% of the assistants (most of them thus always search themselves and often for someone else). Correlation between hierarchy and intermediate usage is very strong: Spearman's Rho = .50\*\*. Because of these strong hierarchical relationship we see also correlations with age, amount of years employed and even gender: Correlations between intermediate usage and age: Pearson's r = .29\*\*, with years of employment: r = .39\*\* and with gender: T-test T = 2.87\*\* with assumption of equal variances (F=3.4, p>.05).

<sup>57</sup> 91% of the partners asks others to search, dropping to 87% of the managers, 65% of the seniors and 22% of the assistants. Correlation between hierarchy and the intermediate usage of market-related electronic information services: Spearman Rho = -.57\*\*.

<sup>58</sup> Spearman's Rho = -.26\*\*

<sup>59</sup> Also: top journalists seem to ask it more often than the others: Kruskal Wallis chi = 8.83\*.

In the other two organizations of the professional services industry, we clearly see that intermediate usage is predominantly performed by colleagues, also with a clear hierarchical influence. In the majority of cases within 1-of-6, the indirect users are the junior advisors (51%), followed by the support staff, including the KRC (25%). Of all indirect users of Wolters Kluwer cd-rom's in 2-of-6 (N=83), 82% of them asks assistants to do the job, followed by the next step in the hierarchy (seniors are asked by 45%). The librarian follows with a great gap and is only asked by 12% of the indirect users. Compared to the indirect use of Wolters Kluwer databases, the support staff is a bit more popular for indirectly using the market-related information services: 28% of the indirect users ask marketing, 26% ask secretaries and 22% ask the librarian.

The role of the corporate libraries and the information professionals is limited. Respondents clearly prefer colleagues over the librarian, and they also state that the closer the information behavior concerns the primary processes or tasks of their jobs, the less they want to rely on the professional intermediaries. A director in auditing at 1-of-6 clearly states that Wolters Kluwer has to be used directly: "you need to do it yourself, because you are the one who has to write the report". For the market-related services, one could use the Knowledge and Research Center (KRC), because "if you do not use these databases regularly, you do not get the skills". The KRC is quite popular, but its role is limited because of its centralized position in the organization. Yet, interviewees still seem to prefer a centralized position, despite its negative impact on usefulness:

*"If you would have these people in the profit-and-loss responsible business units, they would need to have their own clients and then you could get the dilemma that they both need to serve a client and inform the internal organization. You need to specialize these people, even though this might mean professionals and librarians don't understand each other." (fiscal director).*

In the TV news organization, we also see some indications that intermediate usage isn't suited for information behavior that is closely related to the primary process. The ones who search for others feel less of a time constraint and are more frequent users of the general electronic information services (not including the press agencies).<sup>60</sup> This could also explain the relationships with the interest in static information and with spot news<sup>61</sup>.

In conclusion, traditional sources and intermediate usage can be an alternative way to reduce environmental uncertainty. Intermediate usage of electronic information services is especially popular among the higher management layers of an organization and when it concerns information tasks that are not closely related to the primary tasks of the user. Intermediate usage is preferably carried out by direct, younger, colleagues instead of by librarians. Their role seems to be limited.

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<sup>60</sup> Spearman's rho = .45\*\* between frequency of searching for others and frequency of using the general electronic information services. Same relationships exist with individual services, e.g. with internet usage Rho = .31\*.

<sup>61</sup> Kendall's tau c = .36\* for the relationship between searching for others (dichotomous) and interest in static news and tau c = -.40\* for the relationship with spot news.

## **7.8. Usefulness of electronic information services**

Despite high levels of environmental uncertainty, many respondents do hardly use any of the electronic information services. Some don't use these services because they prefer alternatives; they use traditional sources or ask others to search for them (intermediate usage). Others may believe that these services are not very useful in reducing environmental uncertainty, because they do not satisfy information needs. We have proof in especially the professional services industry that there is a mismatch between information demand and information supply. This mismatch of demand and supply does not affect the general attitude towards the usefulness of electronic information services. Almost everybody is very positive about the effects of usage for individual work performance as well as for the performance of the organization as a whole. Uses are even more positive than non-users on the effects they perceive or expect.

### **A mismatch between demand and supply in the professional services industry**

Despite high levels of environmental uncertainty, many respondents do hardly use any of the electronic information services or none at all. In some cases this is because these services do not help to reduce environmental uncertainty, because they do not satisfy specific information needs. This especially seems to be the case in the professional services industry in which we closely examined the differences between the various disciplines in their rating of the importance of the various environmental segments. We conclude there is a mismatch between information demand and information supply, which might have caused a lack of a relationship between environmental uncertainty (demand) and the use of electronic information services (supply).

The organizational environment is very important to the professionals in the professional service industry. Especially information about the client's organizational environment is essential. Everybody wants to be informed about developments in professional knowledge, but only the tax and legal advisors are served satisfactorily with the Wolters Kluwer cd-rom's. Consultants believe they don't have services to be informed about professional knowledge. Especially auditors and consultants need market information; some (especially consultants) use the internet, others use something else – at least there is no one clear source for market information. There is no Wolters Kluwer equivalent for market information.

It is no surprise that the professionals of all disciplines within the three case studies (1-of-6, 2-of-6 and 3-of-6) show a high interest in the organizational environment. All disciplines score high averages of interest, and for only a few of the segments a majority of the professionals were of the opinion that these segments were of little or no importance for their work. There seems to be a clear distinction between environmental segments that give direct input into the professional

knowledge of the auditors, tax advisors and management consultants and segments that provide background market information.

Environmental segments are important in so far as they help professionals in serving the client. We didn't see any importance of segments that were essential for the firm itself (like human resources and to a lesser extent competitors). There is a clear need within the professional services industry for information regarding the market of clients and developments taking place in the organizational environment of clients.

As one manager puts it: all information is client-driven or deals with changes in legislation. A consultant director said: "business units do not automatically stimulate exchange of information, because they have to focus on their own profit & loss and we should not exaggerate in our goal to work in multidisciplinary ways. We don't want to be overwhelmed with information. It has to be demand-driven and therefore it has to be focused on customer information." And with an organization like 1-of-6 "you can hardly structure the information: every company in the environment can be potentially important, especially when you work in relatively short projects". The focus on the environment is even expected to grow because of the strategic goal to work in multidisciplinary teams around sector groups that focus on a specific industry, instead of a specific discipline. Professionals expect they will experience more diversity in their information needs: "Sector groups have very varied assignments within a specific industry. These groups need a lot of market information and need a lot of cooperation between the various disciplines, both during acquisition as well as during the assignment."

There are many differences between the three disciplines in their present information needs, because the organizational environments is so much related to their specific services for their specific client. These differences between the various professional practices were one of the recurring themes in the interviews. One of the most important differences concerns the relationship with clients: "Some clients of the auditors remain so for 15-20 years, while in consultancy you continuously have to acquire new clients and you need to have a more dynamic structure. The lifecycle of a client with a consultant is much shorter." (marketing manager). As a manager of a Corporate Finance department in 3-of-6 states: "you cannot equate the work in any way; it is routine-like versus ad-hoc. We only make use of prospective information about future trends. We look to the future, they focus on retrospective information. We continuously have new clients, they have long-term relationships with existing clients. They often need the same information year after year, we continuously need new information because we have new clients with new problems. They have the same problems every year. You simply cannot compare the two jobs."

However, from our surveys we conclude that the interests in the organizational environment seem to be quite the opposite of what we expected: auditors have the highest average score on all the

environmental segments combined<sup>62</sup> and most importantly the auditors seem to value market information the most, while consultants express a very high need for information on professional knowledge (methodologies) and on the direct input of their work: management & organization. For the auditors and the tax advisors the professional knowledge consists of information about legislation and methodologies, and for consultants it consists of also methodologies/technologies and literature on management & organization. For example in 1-of-6, 100% of the professionals in both the tax and legal department considered developments in legislation important. This is only the case for 40% of the management consultants.

On all but information on competitors and socio-economic information the differences between the various practices are very significant<sup>63</sup>. A comparison of means shows that management consultants differ most from the other two major disciplines (see table 7.16.). The rows show which segments the various disciplines consider significantly more important than the other disciplines (as mentioned in the columns). As a consequence, the columns show which segments are considered significantly less important than the other disciplines.

<b>Professions</b>	Accountants (-)	Tax advisors (-)	Legal advisors (-)	Management Consultants (-)
<b>Accountants (+)</b>		Macro-economic Management Industry	Marco-economic Clients	Legislation Clients Human resources Financial Macro-economic
<b>Tax advisors(+)</b>	Legislation			Financial Clients Legislation
<b>Legal advisors (+)</b>	International Legislation			Financial Legislation
<b>Management Consultants (+)</b>	International Management Professional	Management Professional Industry	Management Professional	

Table 7.16. Differences on interest in environmental segments between disciplines in 1-of-6

Table 7.16. shows that accountants have on average a higher interest in legislation, clients, human resources, financial markets and macro-economical developments, than management consultants do. Management consultants on the other hand show a higher interest in international information, information on professional knowledge, and on management & organization.

Within the business assurance (accountancy) department we see differences in hierarchy: (junior) auditors show a significantly lower interest in information about the organization's environment in

<sup>62</sup> Anova F = 8,4\*\* with Levene's test  $p > .05$  on the amount of segments that are fairly to very important. The average of auditors is 7.8 compared to 6.7 for the management consultants. Post-hoc-tests show these differences to be significant\*\*. Also the total average is 2.91 for auditors en 2.77 for consultants (of all the items). These differences are also significant according to Anova F = 4.2\*\* and Post -hoc-tests show a significant difference between the two\*\*.

<sup>63</sup> Kruskal Wallis chi ranges for the significant items from 21.4 to 302.4 (for legislation)\*\*. Note: in most cases there is no homogeneity of variances.

general than the managers and the partners<sup>64</sup>. In the other departments there are no significant differences between the various hierarchies.<sup>65</sup>

The problem however is that the present information supply in especially 1-of-6 does not match with the information needs we have found in our survey. Auditors predominantly want market information and professional knowledge (legislative information) and show a diverse interest in the various environmental segments, but they presently receive mostly legislative information from internal research agencies. On the other hand, consultants get mostly company & industry information from the Knowledge & Research Center, but report a clear lack of information on their profession (management & organization literature). Consultants seem to be stuck in the middle: they don't know where to go for their input for professional knowledge, or at least don't get it yet from the electronic information services. And they don't get enough of market information.

As a consequence there are many non-users among the auditors and the consultants. Only 9% of the tax advisors and even 0% of the legal advisors use none of the 22 external databases (including internet) that are available in 1-of-6. This percentage is much higher for the consultants (36%), but especially among the auditors we see a large number of non-users: 42%<sup>66</sup>. So, contrary to common belief, auditors show the greatest diverse interest in the organizational environment, but they don't use the electronic information services as much as the others do, because they really only are served with information about external developments in professional knowledge and legal issues, which is not as dynamic as for the tax and legal advisors.<sup>67</sup>

We have also asked all respondents on which segments they are not sufficiently informed. The same picture occurs. All disciplines in both 1-of-6 and 2-of-6 feel a lack of market information (about clients, industries and competitors) (see table 7.17.).

Missing information in 1-of-6 (N=780)		Missing information in 2-of-6 (N=158)	
1. Industries <sup>68</sup>	46%	1. Clients	54%
2. Clients	37%	2. Industries	51%
3. Competitors	30%	3. Professional knowledge	44%
4. Management & Organization	18%	4. Competitors	31%
5. Financial markets	17%	5. Financial markets	29%

Table 7.17. Many respondents in 1-of-6 and 2-of-6 lack market information

<sup>64</sup> Anova  $F=8.0^{**}$  with Levene's test shows  $p>.05$ . Post-hoc-tests show that the difference between juniors and partners, and between juniors and managers are significant\*\*.

<sup>65</sup> We have also tested relationships with some demographic characteristics like gender, age, and amount of employment years, but these do not show significant relationship or very low correlations.

<sup>66</sup> Cramer's  $V = .29^{**}$

<sup>67</sup> Within 2-of-6 there are no significant differences in the use of internet between the various divisions (although internet is the most popular among consultants) and between the various hierarchical levels (partners use the internet only a little bit less compared to the others).

<sup>68</sup> Another surprising difference between the various disciplines is the perceived lack of industry information. 57% of the auditors feel this lack compared to only 37% of the consultants and 28% of the tax advisors. These differences are significant according to Kruskal Wallis  $\chi^2 = 46.5^{**}$

The information about external developments in professional knowledge of auditors and tax advisors (legislation and methodology) is well taken care of in 1-of-6. Almost none of these professionals (5% of the tax advisors and 12% of the auditors) say they are insufficiently informed about these segments. This is quite different for the management consultants. 30% of them do feel a lack of information about changes in their professional knowledge (methodology and management & organization)<sup>69</sup>. In 2-of-6, however, they are less satisfied with the degree of information on professional knowledge. The reason might be that many people complain that the Wolters Kluwer cd-rom's are often not available because of technical difficulties. Maybe, the lack of an internal agency who interprets external developments and distributes this throughout the organization (as was happening in the other organization) causes some of the distress. For these two reasons, this organization differs from the previous case (1-of-6).

In conclusion, the many differences in interest in segments of the (client's) organizational environment and the limited and/or scattered possibilities to get market information result in a very low correlation between environmental uncertainty and the use of electronic information services. Electronic information services are only able to serve niche interests in segments of the organizational environment. For example, there are only correlations between interest in legal information and the use of legal information services (from Kluwer).

### **Perceptions on the effects of usage**

Despite high levels of environmental uncertainty, many do hardly use any of the electronic information services or none at all. This might be caused by the perception of employees that electronic information services are not very useful and do not help employees to improve their performances. The former paragraph shows that the usefulness is severely limited by the mismatch between information demand and information supply in the professional services industry. But still, most respondents have a very positive attitude towards the effects they perceive or expect from the use of electronic information services. If used, they believe it will considerably increase the performance of themselves as well as of the organization as a whole.

### **Effects on job performance**

A lot of users seem to be positive about the effects of using the electronic information services for their job performance. It especially helps them to find information easier, and to get it in a more focused manner. Within 1-of-6 and 2-of-6 they also believe it helps them to better serve their clients. The lowest scores are on the innovative possibilities of electronic information services. From just 36% of the respondents in 1-of-6 who believe they are able to find unique information they can't find elsewhere to about 60% of the respondents among the newspaper journalists (see table 7.18.). The negative effects on information overload seem to be relatively modest: only 16 to 34% believe they are less able to process the amount of information. In 2-of-6 we made a distinction between

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<sup>69</sup> These differences are significant according to Kruskal Wallis chi = 48.5\*\*

the Wolters Kluwer cd-rom's and the market-related information services. The largest differences between the services concerns the effects on innovativeness: just 16% of the Wolters Kluwer users (strongly) agree with the statement they can find information with it they can't find anywhere else compared to 52% of the users of the market-related information services (including the internet). The same difference occurs on the statement on whether the use of services stimulates the creation of new ideas (45% of the Wolters Kluwer users compared to 75% of the market-related services).<sup>70</sup>

Task effects	1-of-6 <sup>71</sup> (N=186-191) <sup>72</sup>	2-of-6 market (N=122- 123)	2-of-6 WK (N=117-119)	News- paper Holding (N=88)	News- paper Journalist (N=47-48)	TV News (N=48)	Clothing (N=96)
Easier to find information	63%	n.t.	n.t.	82%	79%	54%	63%
Finding information more focused	60%	84%	80%	80%	71%	71%	68%
Finding unique information	36%	52%	16%	58%	60%	50%	n.t.
Better serving my clients	58%	77%	64%	n.t.	n.t.	n.t.	n.t.
Stimulating new ideas	52%	75%	45%	75%	n.t.	n.t.	n.t.
Creates information overload	16%	29%	19%	33%	34%	n.t.	n.t.
Better informed about market	26%	n.t.	n.t.	n.t.	n.t.	n.t.	27%
Finding information faster	n.t.	84%	87%	n.t.	n.t.	n.t.	n.t.
Finding better information	n.t.	n.t.	n.t.	n.t.	60%	n.t.	n.t.
Better job performance	n.t.	n.t.	n.t.	n.t.	77%	n.t.	n.t.

Table 7.18. Percentage of users that (strongly) agree on statements of individual effects.

Furthermore, the more one uses, the more positive one is about the effects of use<sup>73</sup>. And the more experienced one is the more positive effects one sees<sup>74</sup>. Finally, self-perception also influences the

<sup>70</sup> Wilcoxon signed ranks tests show a significant difference on both unique information ( $Z=5.2^{**}$ ) and on new ideas ( $Z=-3.0^{**}$ )

<sup>71</sup> The first three statements form a homogeneous scale ( $\alpha = .69$  and item-total correlations of at least .31) and a uni-dimensional factor which explains 63.7% of the variance (and component values of at least .56).

The next three statement also form a homogenous scale ( $\alpha = .73$  and item-total correlations of at least .52) and a uni-dimensional factor which explains 65.3% of the variance (and component values of at least .78)

<sup>72</sup> because of a fault in the questionnaire, approximately 40-41 of all respondents did wrongfully not answer this question. Another 33% didn't have to because they don't use any of the electronic information services.



perception of effects on their own work performance; the more skilled a respondent believes he is, the more positive he is on the effects of using Wolters Kluwer databases<sup>75</sup>.

The effects on job performance seem to occur in different stages. First it helps to improve user's information behavior – getting information more efficient and effective – and then it helps to improve the quality of service towards their clients. The five frequent users of the Intranet in 3-of-6 see it is very supportive for their jobs in which they need a lot of external information. Four out of these five see positive effects in their information behavior – they find it easier to search for information and they believe it to be more focused and faster. The fifth frequent user believes the Intranet to be mere supportive – “besides this, a lot more has to happen”.

Eleven interviewees of 3-of-6 agree that it is easier to find the relevant information in a more targeted fashion. Because it is easier, it also takes less time to gather the needed information and most respondents see therefore a decrease in time they spend on information gathering. “We can faster consult different sources and more targeted. I don't have to read entire magazines anymore.” The other three think alternative sources like books are easier to use.

Seven of these eleven respondents also think the quality of the information increases and thus the quality of the work they are doing, especially concerning the services for their clients: because they are better prepared, they are better able to advice their clients and make the proposals for advices more tailor-made. “The quality of information in the proposal phase increases with a positive impact on the value of the end product because you are better in tune with the client's developments.”

The intranet does not influence the speed of work. Information search is just one of many aspects of their work. One respondent says he is able to find information faster, and he is able to improve the quality of his work, but it does not necessarily save time. Furthermore, five interviewees see an increase in the amount of information they have to cope with. “The more information you get, the more you want”, as one put it. Another respondent says the use of clippings from the Dutch daily with financial news (*Het Financieele Dagblad*) has motivated him to become a regular reader of the paper version of this newspaper, which he didn't read before.

Almost nobody says they are now, as a consequence of the intranet, able to find information they could not find before. There were always alternative sources. One interviewee, however is impressed with the information you can have before you meet a prospect: “you can have a fantastic overview of what has happened in the last of time in their industry; newspapers are no alternative; you would have to go through a whole stack of newspapers to get this overview.” Again, only the services with marketing formation provide unique information.

<sup>73</sup> In 1-of-6: Pearson correlations between effects on information processing and (a) amount of information services  $r = .25^{**}$ ; (b) amount of market-oriented services;  $r = .30^{**}$ ; (c) amount of time spend on services  $r = .25^{**}$ ; and (d) use of the internet  $r = .22^{**}$ . Pearson correlations between effects on results of information processing and (a) amount of information services  $r = .24^{**}$ , (b) amount of market-oriented services  $r = .34^{**}$ ; (c) the use of the internet  $r = .26^{**}$

<sup>74</sup> In 2-of-6: Relationship with the scale of all items but “too much information” and “unique information”(alpha on this scale = .74, explained variance = 59%): Pearson  $r = .37^{**}$

<sup>75</sup> In 2-of-6: Spearman's rho =  $.26^{**}$

The users of the general electronic information services and the internet specifically in the TV News organization are very enthusiastic about their usage and seem strong advocates for using these services. As we will see in the next paragraph users are very confident about their own searching skills and they tend to talk a lot about it with others and believe the organization doesn't do enough of that. Furthermore, they are very positive about the added value of these services (see table 7.19.).

N=48	% (strongly agrees)	Mean
• <b>Electronic information services are a useful supplement to other sources of information</b>	61%	3.63
• <b>Electronic information services provide my a lot of relevant information</b>	63%	3.67

Table 7.19. Added value of electronic information services according TV journalists.

The more one uses electronic information services, the more added value one sees compared to what is already available.<sup>76</sup> There are also strong relationships with the self-perception of skills and the appraisal of electronic information services in terms of added value<sup>77</sup>.

Among the employees of the newspaper company there is also a lot of consensus on the positive effects of internet usage. Both the journalists as well as the staff members of the holding company are very enthusiastic about the possibilities of internet. Because there is so much consensus on the effects of usage, we don't see many differences between the various respondents, although there is a relationship between the self-perception of the staff members and their perception of the effects of usage<sup>78</sup>. The respondents of the garment & clothing industry have shown the same positive perspective on the effects on the individual information behavior and again there isn't much variance between the respondents.

### Organizational effects

On the perception of organizational effects most respondents are even more positive than on the individual levels. Non-users were asked to give their opinion as well. In all, these statements seem to refer more to a positive attitude concerning their expectations on the usefulness of electronic information services, than to a perception of present reality and respondents don't seem to make much of a difference between the various statements: they generally think it has a positive effect<sup>79</sup>. In the professional services industry, the highest scores are on the effects for more client orientation

<sup>76</sup> The more one uses the internet, the more positive one is about added value (spearman's rho = .60\*\*) – the same is true with the usage frequency of the Volkskrant (rho = .43\*\*) and with the usage frequency of all the electronic information services (Pearson's r = .54\*\*)

<sup>77</sup> Spearman's Rho = .59\*\* for the correlation between self-perception of skills and the appraisal of added value.

<sup>78</sup> Spearman's rho = .38\*\* between self-perception and www effects

<sup>79</sup> For example, in 2-of-6 the combination of organizational effects has an Alpha = .90 and all item-total correlations are above .63.

and organizational intelligence (better informed). The innovative effects (on ideas and new business development) will less likely occur, according to many respondents. In the newspaper company they foremost see an effect on the performance of journalists (see table 7.20.).

<b>Organization effects</b>	<b>1-of-6 (N=743)</b>	<b>2-of-6 (N=167-168)</b>	<b>Newspaper Holding (N=117-121)</b>	<b>Newspaper Journalists (N=75-83)</b>
<b>Better informed about outside world</b>	72%	84%	n.t.	n.t.
<b>More reliable information</b>	53%	66%	34%	57%
<b>More client oriented</b>	72%	86%	n.t.	n.t.
<b>More efficiency in using information</b>	56%	75%	46%	60%
<b>More market oriented</b>	59%	77%	47%	27%
<b>More new ideas for products</b>	53%	65%	55%	31%
<b>Better in business development</b>	n.t.	66%	n.t.	n.t.
<b>Journalist perform better in their jobs</b>	n.t.	n.t.	67%	82%

Table 7.20. Percentage of respondents that (strongly) agree on statements of organizational effects

In 2-of-6, we see that the ones who are most active in traditional ways of scanning are more positive<sup>80</sup> and the more one uses electronic information services, the more positive they are<sup>81</sup>. So, everybody seems to have a positive attitude towards electronic information services, but users of electronic information services and active scanners seem to be even more positive.

The users of the intranet in 3-of-6 seem to strongly believe the intranet will increasingly become a competitive necessity. All the interviewees believe external information is more accessible for organizational members at all levels. As a direct result from this increased availability and accessibility of market information the organization can do a better job, especially towards clients. This kind of information is mainly used as background information about their clients/prospects and about trends and developments which can help in benchmarks for their clients. "It is easier to request information about a company, because in the old days you were dependent on the corporate library (the present information and research center) and you had to pay for their services. If you now meet a client, you are better informed and clients appreciate it." Another one sees an increase in effectiveness, because you can become more "effective in your decision-making and in the acquisition of assignments. You increase the added value for your client and this results in an improvement of effectiveness."

One auditor does not see these effects, because he does not need much of this kind of information. Another one "would be surprised if suddenly clients would say that they noticed we are more update and aware of their industry." Also, one merely sees the intranet as a support tool, with even a

<sup>80</sup> Pearson r = .24\*\*

<sup>81</sup> Pearson r = .23\*\*

possibility that the information impoverishes, because people will feel less an urge to browse to other sources. "I don't believe these automated systems can produce truly up-to-date, adequate and tailor-made information. In many cases, you just need people with experience."

In the end, however, the development of the intranet will be a competitive necessity for 3-of-6, believe many interviewees. "If you don't and others do, we will fall behind with our competitors. Information is of vital importance to our work." Another one says that it increases their competitive position in relation to the smaller firms, because "smaller firms often do not have these sources". And two other respondents believe they can treat prospects better and thus acquire more clients (even in competition with other firms).

In the horeca case we were asked by the commissioner (SVH) to be more specific in the formulation of statements on their perception on the possibilities of the internet. Because we expected the use of internet to be limited, we focused on attitude and expectations – to what degree are they interested in using the internet? We formulated several statements that relate both to the scepticism and the enthusiasm for internet<sup>82</sup>.

These statements show strong relationships with a few of the most important variables of our research project. First they correlate strongly with the use of internet<sup>83</sup> and with the expectancy to start using the internet soon<sup>84</sup>. Secondly, the interest in environmental segments is also strongly related to these attitudes of scepticism and enthusiasm (or the lack of it). The more the respondent is interested in information about the transactional environment, the more enthusiastic he is about the internet. The same relationship is true for interest in information about the contextual environment<sup>85</sup>.

All respondents were confronted with two other statements on relevance of the internet, specifically whether they believed the internet provided useful and relevant information for their company (69% (strongly) agreed – n=388) and whether they believe internet is a useful supplement to the existing information sources (74% (strongly) agrees – n=390). These statements can be combined under the label of relevance<sup>86</sup>. There is a direct relationship between relevance and present use. Thus the

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<sup>82</sup> These seven statements constitute a homogeneous scale with alpha = .75 (and all item-total correlations are above .31). Factor analysis generated two factors explaining 60.3% of the variance. One factor expresses the scepticism of internet – with statements such as "It will take at least five years before the SVH community is up & running", "The student will use distance education a little because he will not be motivated", "The social contact between students and schools will disappear as a consequence of the emergence of electronic services", and the other factor expresses the enthusiasm for the internet, with statements like "Electronic information services are important for the horeca", "I am very interested in a SVH community", "Internet in a horeca company is a must", "I want to make use of electronic educative services".

<sup>83</sup> Spearman's rho = .43\*\* for the relationship between frequency of internet usage and enthusiasm and spearman's rho = .34\*\* for the relationship with scepticism (everything is positively recoded).

<sup>84</sup> Spearman's rho = .51\*\* for the relationship between enthusiasm and expectancy of using internet.

<sup>85</sup> Spearman's rho = .34\*\* for the relationship between enthusiasm about the internet and interest in the transactional environment. Spearman's rho = .31\*\* for the relationship between enthusiasm and the interest in the contextual environment.

<sup>86</sup> Alpha = .75 with item-total correlation = .60. and a factor explaining 80.3% of the variance.

more one uses the internet, the more they see the relevance of it<sup>87</sup>. Also, the more one is interested in the transactional and contextual environment, the more one sees the relevance of internet<sup>88</sup>.

In conclusion, most respondents are (very) positive on the possible consequences of the use of electronic information services for their individual job performance and the organization as a whole. The more one uses these services, the more one generally perceives positive effects. It is unclear whether these perceptions are a reflection of a general attitude towards electronic information services (mostly positive, some neutral or negative) or whether they are perceptions of what users actually experience. The interviews in the professional services industry show the users can easily give concrete examples of how the use has benefited their work. Also some of the answers may be caused by political motives – trying to convince management to be more generous with granting access to electronic information services. In any case, management will find fertile grounds for further implementing these services, especially on market information, such as information about industries and clients/prospects. The low levels of use despite high levels of environmental uncertainty can not be caused by a negative attitude on the usefulness of electronic information services, considering the high expectations respondents express.

### **7.9. Barriers of use: awareness & accessibility**

Despite high levels of environmental uncertainty, many respondents do hardly use any of the electronic information services or none at all. Besides a mismatch between information demand and supply and the preferences for alternative sources (especially traditional information sources and intermediate usage), we also see many barriers for use. Many respondents are simply not aware of the possibilities of electronic information services. Furthermore, respondents are critical of the accessibility of these services and organizations are not willing or capable to increase the accessibility. Although the role of librarians is limited as intermediate users of electronic information services, they can be influential in stimulating and increasing the use of these services in their organizations. Their primary focus could be on lowering the barriers of use. One of the major barriers of usage, according to the interviews and surveys in several cases, was the lack of publicity. Because of this, many respondents probably did not know these electronic information services are available, and if they did, did not know how they can benefit from it and which information was available. There is also a role for the IT departments to increase the accessibility of electronic information services. They could especially work on integrating electronic information services with internal networks.

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<sup>87</sup> Pearson  $r = .25^{**}$  for the relationship between relevance and present internet usage. There is also a relationship with the expectancy of internet usage: Spearman's  $\rho = .49^{**}$ .

<sup>88</sup> Spearman's  $\rho = .29^{**}$  for both relationships.

## Awareness

Almost all respondents we have asked believe their organization should do more to create awareness of the availability and possibilities of electronic information services (see figure 7.7.). There is enormous consensus; in most organizations a majority of the respondents are dissatisfied with the information and knowledge management policies concerning the use of electronic information services. Most organizations were very reserved in stimulating the use of electronic information services and clearly most employees (strongly) disagree with these policies.

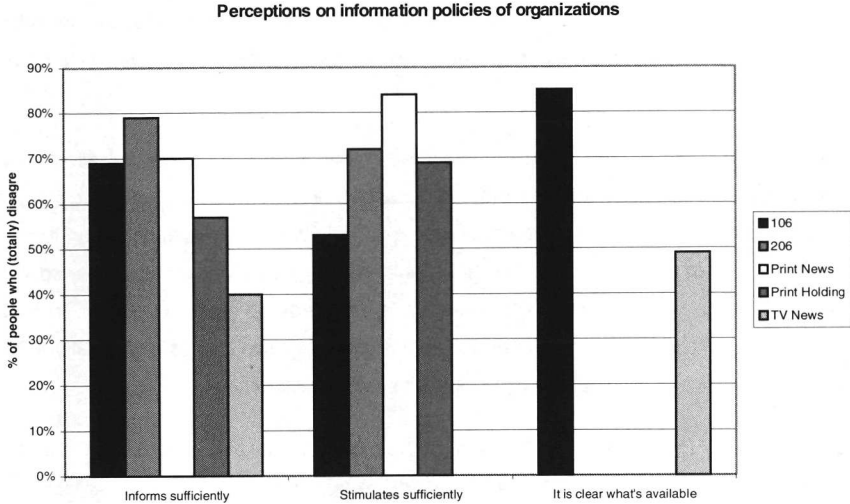


Figure 7.7. Attitudes towards information policies in different cases

Most interviewees of 3-of-6 believe the lack of publicity hampers the use of electronic information services. They have the impression that the Intranet is not frequently used by colleagues. Seven respondents believe colleagues use it (a lot) less than they do and four believe it will be more or less the same. Besides a mismatch between information supply and demand for consultants, six respondents explain the lack of use by unfamiliarity of their colleagues with the Intranet. The majority of the respondents believe that the staff of the corporate information and research center did not do enough to stimulate use of the Intranet. The interviewees knew about the Intranet, because they knew someone at the information center or they read about it once in the internal newsletter. "But unfortunately, this kind of information is ignored or quickly forgotten by most people".

There is much consensus in the professional services industry that their organization could do more to make employees aware of the possibilities of electronic information services. But these kind of professional bureaucracies are very reluctant to create cost centers or staff departments which cannot bill their services to clients. Although 1-of-6 was actively working on a policy of knowledge management, the information manager says it is quite complex in an organization like 1-of-6. "This

is because the practice-based business unit structure. A steering committee controls the information management from the various disciplines. System management is geographically organized and there is hardly any application management. I am continuously busy with putting out fires and solving little crises and there is no time for any strategic reflection or making policies." The marketing manager sees the same problem: "we have many good ideas, but we are weak in the management of our operations; a typical characteristic of a professional bureaucracy, because we have only a few staff units and they are always merely seen as a cost center". But the marketing manager is optimistic: "We are on the right track. We now have created a center for documentation which goal it is to professionally look at the outside world. Only a year and a half ago, with all do respect, it was a big mess which cost a lot of money... Furthermore in an organization which is allergic to overhead, we have chosen a concept in which a research center is developed that can do research for the professionals."

In 2-of-6 it is even worse; they are even more negative on the policies of their organization. As with all professional bureaucracies and the previous cases, there seems to be an allergy for staff employees and in this organization even more so – probably because it is smaller than the other two. Staff is truly seen as a cost center: "we have all these very critical and academically educated over-stressed people, who don't take policies as a rule. Regularly we get a remark like; 'well, well, with how many people are you doing all this and how much does it cost..'. This is no fun if you know you have been working really hard for them", as the marketing associate notes.

The same is true for the technical infrastructure of the organization. Most of it is imposed from the United States, but there has been little attention for organizing and managing the infrastructure. The ICT manager favors a much more restricted policy, than most of the professionals. "I am continuously busy with putting out fires, constantly solving crises. We have a very differentiated infrastructure, because everybody shouts they are unique in their needs" (the ICT manager). This discrepancy between the position of the policy makers and the perspective of the employees also exists in the media cases. In contrast with 1-of-6 and 2-of-6, here we do see differences between users and non-users. The more time users spend on the internet, the more strongly they agree about the importance of stimulating usage<sup>89</sup> and the lack of information given on the possibilities<sup>90</sup>. The staff members of the holding company are equally negative about the way management deals with the internet. There are strong relationships between the importance of the external environment and the emphasis the users put on that everybody should have access to the internet<sup>91</sup> and these boundary spanners also believe internet should be actively stimulated<sup>92</sup>. The newspaper organization was at the time of study very reserved about providing people access to

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<sup>89</sup> Spearman's rho = .38\*\*

<sup>90</sup> Spearman's rho = -.30\*

<sup>91</sup> Spearman's rho = .39\*\* for the relationship between importance of the external environment and the opinion that everybody should have access. This relationship also exists between with the self-perception of skills and this opinion: Spearman's rho = .33\*\*.

<sup>92</sup> Spearman's rho = .31\*\* for the relationship between importance of the external environment and the opinion that the use of internet should be actively stimulated.

internet. Especially the staff departments were very opposed to these policies and strongly believe that their work can benefit from the use of internet.

Another way to create awareness is through the informal networks in the organization. We have asked all respondents in all cases a few questions on how much they talk about the use of electronic information services and how they perceive others are using it. Only among the TV journalists and the horeca and garment & clothing industry, we have seen a significant relationship between these items and usage. In theory, these are items of social influence – the more the social environment uses it and talks about it, the more one feels pressured to also start using them. 62% of the TV journalists seldom or never talk about electronic information services with others (n=50). 40% expect that others are using more than they are (n=40), but most believe the colleagues are (very) positive about usage: 62% (n=42). We do see very strong relationships between usage of the internet and social influence items: The more one uses the internet and all the other electronic information services, the more one talks about it<sup>93</sup> but the less one (rightfully so) expects others to use more than they do<sup>94</sup>. There is also a very strong relationship between talking about the services and the self-perception of skills<sup>95</sup>. The direction of this relationship is unclear: it could be social influence – that is, because people talk about, people start using it – or it could be a social effect – because people are using it, they start to talk about it with others.

In the horeca case, we have asked the respondents about how they think their colleagues feel about the value of electronic information services, whether they knew other companies who use internet and which percentage of the horeca industry they expect to use internet already. These items were meant to measure the degree of social influence. Approximately 40% of the respondents knew other horeca companies who used internet. Social influence seems to be an important factor in deciding to use the internet as well, since there is a strong relationship between knowing others and using yourself<sup>96</sup>. Also, the more one knows others, the more frequently internet is being used<sup>97</sup> and the sooner they expect to be on the internet as well.<sup>98</sup> The garment & clothing case shows some of the same relationships. In this case too, strong relationships exist between the use of the internet and social influence<sup>99</sup>.

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<sup>93</sup> Spearman's rho = .56\*\* with usage frequency of all the electronic information services and rho = .60\*\* for internet usage, and the same relationship exists with the use of the Volkskrant (rho = .41\*\*).

<sup>94</sup> Spearman's rho = .63\*\* with usage frequency of all the electronic information services and rho = .62\*\* for internet usage, and the same relationships exist with the use of the Volkskrant (rho = .36\*) and NDP (rho = .34\*\*).

<sup>95</sup> Spearman's rho = .53\*\*

<sup>96</sup> Pearson r = .35\*\* for the relationship between knowing others who use and using yourself.

<sup>97</sup> Spearman's rho = .50\*\* for the relationship between knowing others who use and the frequency of internet use.

<sup>98</sup> Spearman's rho = .28\*\* for the relationship between knowing others who use and the expectancy to start using the internet. Social influence is also related to the type of company: hotels (r = .33\*\*) and larger organizations (rho = .30\*\*) seem to know more companies who already use the internet. Furthermore, the more positive one thinks colleagues are, the sooner the company expects to be on the internet (rho = .26\*\*).

<sup>99</sup> Pearson r = .42\*\* between knowing others and the use of internet. Also, the more negative one is about the opinion of others, the less usage we see of other electronic information services (rho = -.26\*). Also, the more others one knows, the sooner one expects to start using the internet (Cramer's V = .45\*\*). Also, the more one knows others who use the internet, the more interest respondents have in contextual information (rho = .35\*\*) and transactional information (rho = .26\*).



## Accessibility

In the surveys, most respondents seem to be reasonably positive about the accessibility of services, but in the interviews many were much more critical and in a relative comparison, the 1-of-6-respondents made a clear statement against the quality and accessibility of electronic information services. In some cases, the non-users were much more negative about the accessibility than the users, which could hint that accessibility is a major barrier.

In all cases we asked respondents whether they agree it is easy to use the available electronic information services and whether they disagree the use of these services is too time consuming. We should however be careful with comparing the results of figure 7.8. In the newspaper company, the horeca industry and the garment & clothing industry, the statements only relate to the accessibility of the internet. In 2-of-6 the accessibility statements only relate to the Wolters Kluwer databases. Wolters Kluwer can be reasonably satisfied with the judgement of the respondents of 2-of-6 on the accessibility of its cd-rom's: 54% find it (very) easy to use and 42% (strongly) disagrees with the statement that they are too time-consuming (N=121). Within 1-of-6 and the TV news organization, the statements refer to all available electronic information services, which resulted in a general neutral answer: 60 tot 64% of all professionals (N=781) of 1-of-6 are neutral to the statements of whether they believe external databases are easy to use and whether they cost too much time to use.

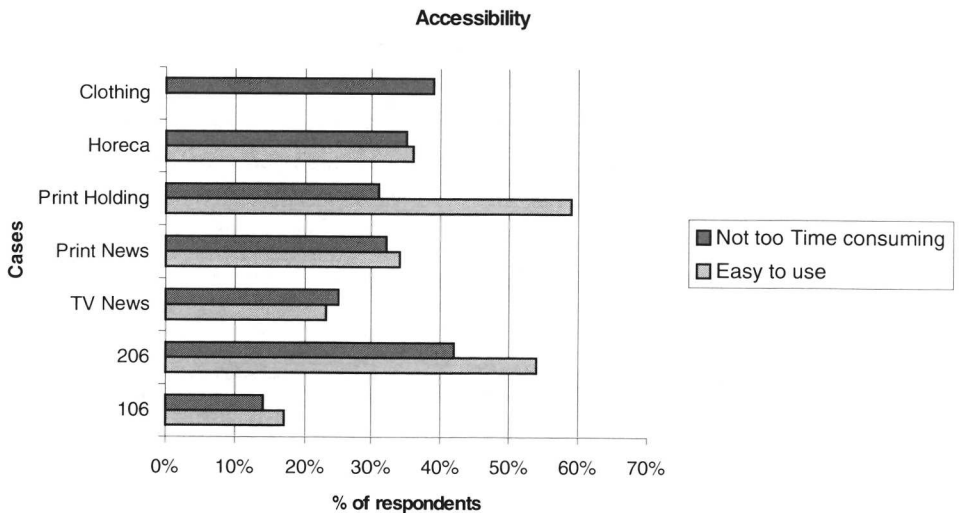


Figure 7.8. Beliefs on accessibility in different cases

Although the respondents in 1-of-6 took a neutral position in the statements on accessibility, they are generally very critical to the accessibility and quality of electronic information services when asked to compare them to other information sources for environmental scanning: which source do they believe to be the best information source for external information and which the most accessible. Electronic information services are considered the least accessible source of information. Remarkably though, this has nothing to do with the lack of affinity with ICT, because the results are very positive for the internal infrastructure (Lotus Notes). Table 7.21 shows the complete ranking.

<b>Quality (N=781)</b>		<b>Accessibility (N=781)</b>	
1. Colleagues	27%	1. Lotus Notes	47%
2. Lotus Notes	14%	2. Colleagues	29%
3. KRC	9%	3. KRC	9%
4. internet	7%	4. internet	6%
5. External databases	5%	5. Internal expert bureau	3%
6. Internal expert bureau	4%	6. External databases	2%
Don't know/none of the above	34%	Don't know/none of the above	5%

Table 7.21. Ranking of sources on quality and accessibility.

External databases score very low: only 5% consider them the best source and 2% the most accessible one – a remarkable gap with the internal electronic information infrastructure. As one consultancy director explains “The infrastructure for knowledge management exists of people, processes and tools. Tools are the least important part. These tools encompass both internal and external databases, of which external database are the least important. External databases contain by definition existing or old knowledge or actually just facts and no knowledge at all.” Naturally, experience with and use of the various sources of information, does influence the choice for best and most accessible source. Of all the users of at least one electronic information service, 16% consider these services (including the internet) to be the best information source. But, we hardly see an increase in the ranking of accessibility .

A very positive impact can be expected from the integration with the internal network (e.g. an intranet). Almost everybody seems to be using it and almost everybody seems to be positive about it. This network is considered second best in information quality but best in accessibility. The management consultants show a remarkable ambivalence about Lotus Notes. Only 6% consider them the best source of information, but 33% think it is the most accessible one. The potential of Lotus Notes for the management consultants has not been fully used yet. If Lotus Notes would carry more services directly aimed at these consultants (for example, a newsletter with professional knowledge/methodologies or with information on management & organizational trends), the use shall probably increase.

Some interviewees of 1-of-6 believe, the use of all these services could be stimulated if they were to be integrated within Lotus Notes. The director of the expert bureau for professional tax knowledge says they are looking for further cooperation with Wolters Kluwer. "The fiscal cd-rom's are updated four times a year and we want to increase the update ratio a lot, because it is crazy that you need to go through our own internal database to get information from the last month or so and you have to go to the library for all the other information." We want to incorporate the fiscal library in a Lotus Notes environment: "we pay attention to score rate (you can not lack an article) and user friendliness – we don't want to train our people for every new cd-rom. That's why we want to integrate it with Lotus Notes, because it increases the currency on the user friendliness and it combines internal and external data. What I would like the most of course is, if I would type in a keyword in Lotus Notes, that I would find both an internal advice as well as some Wolters Kluwer articles and a colleague who has had experience in this field.... The problem however is that you have all these different information providers with their own cd-rom, and it is too expensive for us to rebuild every cd-rom into our network. Either they should do it, or we have to accept some inaccessibility."

Incorporating these services within the Lotus Notes network will increase the accessibility of these services enormously. But this will have a great impact on how electronic information providers will have to sell their services: they have to allow it to be integrated within the organizational infrastructure of their clients. Also, some work needs to be done by the organization itself. One of the most popular information services have been the news letters in which dedicated internal personnel interpret major developments in the outside world on their professional knowledge and methodologies. Organizations need to find ways to interpret external events and distribute these interpretations internally. The Lotus Notes network seems to be suited for this kind of tasks. Truly intermediate usage by librarians – or in this case a Knowledge and Research Center – is mostly useful for the top-management of an organization. And even then, they normally first ask juniors to do the search for them.

The major difference between 1-of-6 and 2-of-6 is the role of Lotus Notes. The popularity of Lotus Notes within 2-of-6 is only a fraction of its popularity in 1-of-6, probably because 2-of-6 has not dealt with it in a structured way: "we have a whole bunch of internal and external sources. And we hardly use any of them. Take the Financial Daily online for example. Their data is stored on Notes. But I don't think anyone is using it. They should post clippings in a mailbox based on previously stated preferences", according to the ICT manager. "They started two years ago with the Lotus Notes network and everybody just throws in stuff. It doesn't add anything to our knowledge, absolutely nothing" (IT-manager). An auditor agrees: "there is so much information and last I tried to check it out and I couldn't get access, so never mind. I don't know what it has to offer".

3-of-6 tried to overcome these accessibility problems by building an intranet in which most sources are integrated. But still, the interviewees were not satisfied. Most of it is related to the searching skills and attitudes of the users. One experienced auditor knows how to quickly search the

traditional books, "faster than I can type a keyword in the Intranet search engine". The organization could help by giving support. Some do believe that a lack of support limits the adoption of the Intranet. Because the Intranet has never been introduced properly, one respondent believes that most people do not know of the existence of the Intranet, let alone know what it has to offer. Others believe that a lot of professionals have a lack of affinity with information – and communication technologies in general. "You have to convince the older ones that they can benefit from the intranet and then you have to show them how it works and you almost have to force them to play with it for at least half a day." Furthermore, some interviewees criticize the lack of support and guidance during the usage of the intranet. "If you call the help desk you get an answering machine". One believes he is quite acquainted with the most obvious possibilities of the Intranet, "but if I would explore the outer limits, I will probably not be able to do so on my own." Two other respondents explain the limited present use of the Intranet by their direct colleagues because of their experience and affinity with information technology, but "there are simply a lot of people who do not like to work with computers", and "it has always been the case within this firm that it takes quite some time and effort to introduce a new application and to let people use it." Two respondents think the Intranet is "self-explanatory" and do not find the lack of support a problem: "the system is so easy to use, it's fair to expect that our professionals should know how to use it within one evening."

Furthermore, it is not always easy to search through the various information sources. One interviewee sums up the searching difficulties: "you cannot always target as much as you would like to, it is sometimes rather surprising what you find under a specific heading, it isn't relational enough, sometimes you do get a stack of paper, but it doesn't say what you wanted to know". Two respondents find it hard to determine where to look for specific information, because it is often stored in different ways on different locations. A great majority state that they are often not able to find the right information. As one respondent puts it: "If you search with a keyword, you sometimes get 12 articles and sometimes 60, and the abstract says things like WFR:1991/nr..So you have to go through the entire long list to get what you were looking for."

So, availability of information sources through an integrated platform is a lot – and in fact 3-of-6 was one of the first organizations in the Netherlands to do so – but it isn't enough. The availability must be brought under the attention of the employees, must be closely integrated in the primary processes of the organization and must be nicely matched to the information needs of the professionals in an integrated manner. Because even in a case where a organization tried to integrate various information sources as much as possible in one intranet with one look-and-feel, users still feel the information sources are rather fragmented. In 1-of-6, Lotus Notes was very thoroughly introduced (with among other things mandatory introductory courses).

In the newspaper company, most journalists answered rather neutral on the different items of accessibility: 41 % is neutral on the statement that the internet is easy to use and 42% is neutral on the statement that internet is time-consuming.<sup>100</sup> Users of the internet are more outspoken than

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<sup>100</sup> The various accessibility items do not constitute a homogeneous scale.

non-users. The more one uses the internet, the less it is considered too time-consuming<sup>101</sup>, the more the journalists think it is easy to use<sup>102</sup>. Putting it slightly different: non-users are significantly more negative about the accessibility of the internet than the users.

Among the staff members of the holding company, a majority of the users (strongly) believe that internet is easy to use (59% think so), but most are rather neutral on the question of the internet is too time-consuming (48%) (n=118)<sup>103</sup>. Again, internet users are also more positive on the easiness of use<sup>104</sup>.

### Capability

The perception of accessibility has much to do with capability: how experienced or how good are people in using electronic information services? The more skilled one is, the more positive one is likely to be about the accessibility of these services. In the horeca and the garment & clothing industry, the capability of an organization to incorporate electronic information services seems also very influential on the use of these services.

One should not underestimate the inexperience of users. internet may have increased user skills, but for most other services, most employees will be novices. In 1-of-6, most users were not very experienced, with an average of 2,5 years, and the experience is almost always limited to the use of databases within this organization. Contrary to common belief, these figures are the same for the younger workforce (younger than 30 years): 82% of them had no experience with these services before they worked in this organization (n=180). This means the organization can not assume that newcomers in the organization are familiar with the various electronic information services. 77% of the users (n=429) in 1-of-6 have a negative self-perception and believe that they don't know sufficiently how to deal with electronic information services. In 2-of-6, 65% have a negative self perception and believe they have hardly any or not enough skills. The ones who use electronic information services, naturally are more positive about their skills<sup>105</sup> and there is also a very strong relationship with the amount of time they spend on electronic information services and their self-perception of skills.<sup>106</sup> Indirect users of electronic information services also show a higher self-perception<sup>107</sup>.

Most respondents in the newspaper holding company have a pretty high self-perception on the skills to use electronic information services: 63% of all respondents (n=123) believe they are reasonably or very well skilled in the use of electronic information services. This self -perception of

<sup>101</sup> Spearman's rho =  $-.51^{**}$  with usage frequency and rho =  $-.37^{*}$  with time spend on the internet.

<sup>102</sup> Spearman's rho =  $.35^{*}$ . Also; the more subjects they search on the internet, the easier it is to use (rho =  $.42^{**}$ ). There is also a strong relationship with self-perception of skills and the statements on easy to use (rho =  $.53^{**}$ ).

<sup>103</sup> None of these items together constitute a meaningful and homogeneous scale.

<sup>104</sup> Spearman's rho =  $.35^{**}$  for the relationship between perceptions on ease of use and the actual use of the internet. The relationship also exists with frequency of internet usage: rho =  $.38^{**}$  and time spend on the internet: rho =  $.35^{**}$ .

<sup>105</sup> Spearman's Rho =  $.57^{**}$ .

<sup>106</sup> Spearman's rho =  $.400^{**}$ . Also: a relationship with years of experience and skills (rho =  $.37^{**}$ )

<sup>107</sup> Spearman's rho =  $.29^{**}$

skills is significantly related to the various accessibility items<sup>108</sup>. Among the newspaper journalists confidence is much lower: 59% believe they are not sufficiently skilled. The more one uses the internet, the more one feels themselves knowledgeable about the possibilities of electronic information services<sup>109</sup>.

Most of the TV journalists do not believe they are very skilled either in using the general electronic information services (besides those from the press agencies). 74% consider themselves a novice at most or hardly know anything about it. Only 11% say they are well skilled to use them. The more one uses the internet, the higher the skills they claim<sup>110</sup>. There are also strong relationships with the self-perception of skills and the appraisal of electronic information services in terms of efficiency<sup>111</sup>

Especially in the horeca and the garment & clothing industry capability is important. On an individual level, respondents are hardly familiar with the possibilities of the internet. 45% of all respondents (strongly) agreed with the statement on that matter.<sup>112</sup> Knowing others who use the internet has a positive impact on the familiarity<sup>113</sup>. The respondents of the garment and clothing industry know very well how to get an internet account (78%, with a mean of 3.89, n=99), but think it is much more difficult to see which information the internet can provide for them: only 10% strongly believe this is clear. 65% believe the internet is a useful supplement to the existing range of information services and this is more or less similar to the horeca case. Especially the novice internet users agree with this statement<sup>114</sup>.

On an organizational level, capability is related to size and infrastructure. internet usage or the expectancy to start using internet soon is more strongly related to organizational capability than to information needs in the horeca and the garment & clothing industry..

The horeca industry is traditionally not a frontrunner in the adoption and use of information and communication technologies. But there are of course many variations within the horeca, ranging from the large-scale hotel and restaurant chains to the small cafeteria around the corner. As we would have expected, hotels are the ones who are most often on the internet and expect more to get on the internet soon<sup>115</sup>. The present usage seems to be related to variables that have to do with the capability of the organization, like size of the organization and the availability of ICT infrastructure. The bigger the organizations, the more likely they are using the internet in our

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<sup>108</sup> Spearman's rho = .54\*\* with "easy to use" and rho = -.22\* for "too time-consuming".

<sup>109</sup> Spearman's rho = .75\*\*, also a relationship with the use of other electronic information services (rho = .57\*\*). Rho = .67\*\* for the relationship with time spend on the internet.

<sup>110</sup> Spearman's rho = .64\*\* with usage frequency of all the electronic information services and rho = .72\*\* for internet usage in relationship with self-perception. The same relationships exist with NPD: rho = .410\* and Volkskrant: Rho = .48\*\*.

<sup>111</sup> Spearman's Rho = .33\*\* for the relationship between self-perception and the perceived efficiency of electronic information services.

<sup>112</sup> Naturally, internet users are more familiar (rho = .40\*\*) as are users of other electronic information services (rho = .28\*\*) and more frequent users (rho = .35\*\*).

<sup>113</sup> Spearman's rho = .33\*\* for the relationship between familiarity and knowing other companies which use the internet.

<sup>114</sup> The longer the experience, the less one sees this added value: rho = -.39\*\*

<sup>115</sup> Kruskal Wallis for present internet use and type of company: chi = 13.9\*\* and for future use chi = 23.7\*\*

survey. Of the companies with more than 50 employees, 50% already used the internet, compared to only 10% of the companies with less than 10 employees.<sup>116</sup>

We also see many relations with the degree to which the organization has adopted an ICT infrastructure and the use of internet. There are strong correlations between the amount of PC's, the amount of PC's with telecommunication links, the amount of PC's with cd-rom and the amount of applications in use and whether one uses internet or not<sup>117</sup>. The amount of PC's and the amount of PC applications also correlate strongly with the expectations on when to start using the internet and similar relationships exist with the use of other electronic information services which 34% of the companies do<sup>118</sup>.

The garment & clothing case shows some of the same relationships. In this case too, strong relationships exist between the use of the internet and ICT-infrastructure<sup>119</sup>, and size<sup>120</sup>, but hardly any relationship exists with environmental scanning and type of company: the clothing production and the trade organizations are expected to use the internet sooner than the garment production industry if they don't use it already<sup>121</sup>.

In conclusion, accessibility of services and/or capability of users can still be important barriers for use. Both organizations and service providers will need to work hard to lower these barriers to further increase the use of electronic information services.

## 7.10. Relationships and differences within cases

Before we make our concluding remarks, we first will summarize the major outcomes per case. In every case different variables emerge as dominant in our model. In appendix C we have summarized all the variables per case and the most important relationships between the variables in each case.

### 1-of-6: Differences between disciplines are dominant

Within 1-of-6 the general relationships seems to be holding after the test of statistics. Environmental uncertainty does relate to the use of electronic information services, although it only concerns specific segments of that environment and relationships with specific services that have content on these segments. Further, the more one uses electronic information services, the more positive

<sup>116</sup> Spearman's Rho = .28 between size and internet usage

<sup>117</sup> Pearson  $r = .28^{**}$ ,  $r = .30^{**}$ ,  $r = .38^{**}$  and  $r = .35^{**}$  respectively

<sup>118</sup> Spearman  $\rho = .36$  between expectation and PC amount, and  $\rho = .28^{**}$  with amount of applications.

Pearson's  $r = .40^{**}$  between amount of PC's with cd-rom and use of other information services,  $r = .28^{**}$  with amount of PC's with modem, and  $r = .38^{**}$  with amount of pc applications.

<sup>119</sup> Spearman's  $\rho = .42^{**}$  for the relationship between the amount of PC's and the use of internet

Spearman's  $\rho = .29^{**}$  for the use of other electronic information services. The more PC's, the longer the internet experience ( $\rho = .53^{**}$ ), the larger amount of applications, the more one uses the internet ( $r = .44^{**}$ ) and other electronic information services ( $r = .36^{**}$ )

<sup>120</sup> The larger the amount of employees, the more experience the organization has with the internet ( $\rho = .52^{**}$ ). Size is related to how early one has adopted the internet, but doesn't have a strong relationship any more with the present usage of the internet.

<sup>121</sup> Cramer's  $V = .33^{**}$  between type of sub-industry and expected use of internet.

respondents are on the effects for their own work as well as the organization as a whole. The most important variable relates to the task characteristics, containing both the division between the different disciplines (auditors, tax, management consultants and legal advisors) and hierarchy. There are many differences between the professional disciplines in their perception of environmental uncertainty and (accordingly) their use of electronic information services. Hierarchy relates strongly to intermediate usage.

Within 1-of-6, there seems to be a clear distinction between environmental segments that give direct input to the professional knowledge of the auditors, tax advisors and management consultants and segments that provide background market information. The electronic information supply is neatly divided along the same demarcation: legislation-information is delivered via Wolters Kluwer, market-information is delivered via internet and other electronic information services. Only, professionals are far less satisfied about the market information. And consultants seem to be stuck in the middle: they don't know where to go for their input for professional knowledge, or at least don't get it yet from the electronic information services.

The entire organization believes management should do more to stimulate the use of these services, because most of them clearly believe in the benefits.

### **2-of-6: Dissatisfied with infrastructure**

There are not many differences between 1-of-6 and 2-of-6. Only, the various disciplines do not differ as much as in the former case, which also results in a more coherent organizational environment. Intermediate usage is much more an alternative in this case, especially among the higher in hierarchy (task characteristics). In this case, environmental scanning in general is included as a variable and it correlates nicely with environmental uncertainty.

There is a big difference between 1-of-6 and 2-of-6, however. It relates to the popularity of the internal infrastructure (in both cases Lotus Notes) within 2-of-6. It is only a fraction of its popularity in the other organization, probably because the other organization has dealt with it in a much more structured fashion (see the interview statements in this chapter). Similar to the previous case, unfamiliarity (part of accessibility) is the reason why non-users say they don't use any of the electronic information services.

The case study shows also that intermediate usage can be quite popular, especially for partners and managers, who can ask others to perform the information searches. The organization doesn't seem ready yet to outsource this information search to research specialists, because for its typical aversion against cost centers. The consequence however is that many do not search for market information at all or find informal and casual ways to do so.



### **TV News: Using under time pressure**

Journalists are under constant time pressures to meet deadlines and to bring the most important news as early as possible to the viewers. This seems to influence their information behavior heavily. Time constraints are an important part of environmental uncertainty. Journalists use what is directly available and appreciate therefore the easy and continuous accessibility of the information of press agencies, like Reuters and AP, although they seem to be dissatisfied with the amount of national news (which should be provided by ANP). Users are positive about the effects. The general relationships between uncertainty, use and effects seem to exist in this case.

There is a strong relationship between the concept of social influence and the use of electronic information services. The more one talks about the internet, the more one uses it. The present users see themselves as the advocates of a new era. They have come accustomed to internet and are very positive about it, they see many positive effects and talk a lot about it with others. Social influence can be both an effect of usage as well as a cause for usage.

In this environment, accessibility is very important – if journalists expect that it takes too much time or effort, they will not use it. This explains why there is little intermediate usage (and when they ask others, there is a strong relationship with less time-constrained information), and why non-users are far more negative on the accessibility of electronic information services than users.

### **Newspaper company: complaints about restricted policies on internet**

By far the most important variable in the newspaper company is accessibility, because of the very restricted policies of the organization to allow employees access to internet. Respondents complain about it and want to stress they want internet badly. Especially the staff departments (task characteristic) were very opposed to these policies and strongly believe that their work can benefit from the use of internet.

In the holding company we have seen that the operationalization of “need for external information” should not be the average of all environmental segments. In a large organization like this, different departments are specialized in different parts of the organizational environment. The IT – department demonstrated low general need, but high need for technological information and this was for them reason enough to actively search the internet.

With very information-intensive professions like journalists, however, we do see in the newspaper company that the sum of various segments shows good relationships with the use of the internet and in their case press agencies. Even here, we see that journalists tend to specialize in certain topics. internet usage was related to the need for hard news information, but users believed internet also to be suited for some of the items of soft news, like special interest. internet can have something for everybody.

Although both the journalists and the staff employees did not express great dissatisfaction with the present supply of information, they very strongly expressed the wish for internet. They expected the effects on information behavior and organizational intelligence to be positive, but there also seems to be a sentiment of being kept away from a goodie.

The most important reason for not-using the internet has been the lack of suitable equipment. Some try to overcome this barrier by taking a private internet account and then trying to let the organization pay for it, others have seen a real alternative in intermediate usage: 60% of the non-users sometimes asks others to search for them. But most of the intermediate users are not very happy with this situation.

**Labor-intensive industries: the internet hype within the hotel & catering industry and the clothing & garment industry.**

internet usage and especially the expectancy to start using the internet soon is more strongly related to organizational capability than to information needs in both the horeca and the garment & clothing industry. Traditional organizational characteristics as size and the development of the PC infrastructure are strongly related to the use of internet. Also, much more than in all the other cases, respondents feel some social influence (part of organizational characteristics). In both cases, the use of internet was very strongly and consistently linked to whether respondents knew other organizations who use the internet or to the degree the respondents believed the industry to be positive about the use of internet. Because the effects in the horeca case were formulated differently and really concern expectations of what impact the internet might have, we see a strong relationship between use (or expectancy to use) and expected effects.

Maybe the most remarkable results of the case study in the two industries with low information intensity is that their managers experience very high interest in the various environmental segments – almost comparable to the interests of business consultants in the professional services industry. The only difference will probably be that this environmental uncertainty will be limited to a fewer amount of people in the organization – as we have seen in the garment and clothing case. But for the top of these organizations, external environments are very important. Many traditional information sources are used to get information about this environment.

**7.11. Conclusion**

Because of the internet, electronic information services have strongly penetrated almost every industry in the Netherlands, even the ones with the lowest information intensity, such as the horeca. The internet has become quickly the most popular of the electronic information services. As a consequence the timing of when the various case studies were conducted has proven to be crucial: the more recent the research, the higher the user rates of internet.

Within the industries with the lowest information intensity (horeca and garment & clothing), the use of electronic information services is mostly limited to the internet. In all other cases (in the

professional services industry and in the media), a much larger variety of electronic services are available and are being used by a much larger portion of the employees of the organization.

We will discuss the major factors of our analytical model shortly (see figure 7.9.).

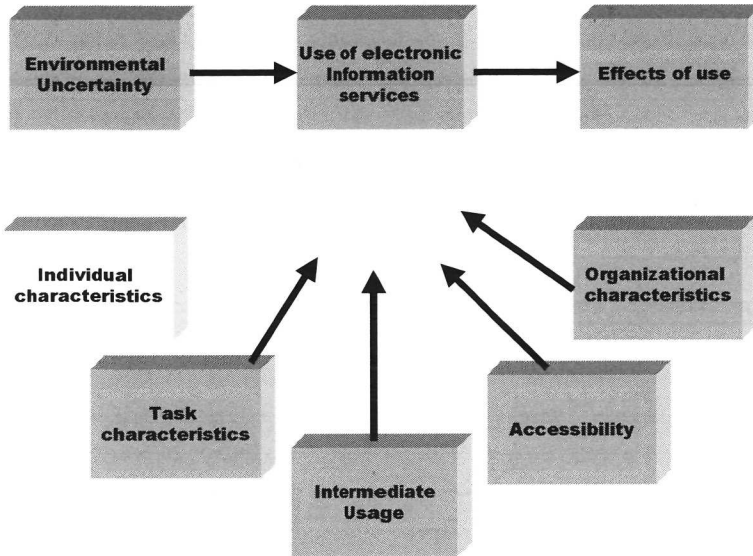


Figure 7.9. Different factors influence the use of electronic information services

Although **environmental uncertainty** and information intensity do seem to influence the variety of services being used, we otherwise see hardly no evidence of a strong relationship between environmental uncertainty and the use of electronic information services. Statistically, it isn't verified that the more uncertain organizations perceive the environment to be, the more they will use electronic information services. The timing of the investigation has proven to be too important. Also, there is not enough variation between the different cases in their perception of environmental uncertainty. This is theoretically an important point: everybody has some interest in the organizational environment and everybody perceives this environment as a whole as rather complex and dynamic. In answering the question on environmental uncertainty, most respondents mostly seemed to state that their environment is uncertain, but that some segments are more important than others.

Also, for most respondents and employees the environment is not so important as a strategic issue: where are we going and how can we react on developments in the outside world? Most importantly, the environment is a source for **task** information. The consultants, auditors and tax advisors in the professional services industry mainly looked at the environment of their clients – what is happening there and how can I incorporate this in my services, my consultancy reports?

The journalists do the same thing: the environment is simply a source of information, a raw material to incorporate in news items.

Within the cases there is much diversity in **usage and environmental uncertainty**, but again we only see a limited relationship between the two. There are only relationships between interest in some specific environmental segments and the use of specific, task-oriented electronic information services. There is a strong correlation between the interest in hard news and the use of the services of press agencies in the media case. There are strong correlations between interest in developments on legislation and jurisdiction and the use of the Wolters Kluwer cd-roms (on legislation). There are strong relationships between the interest in (information) technological developments and the use of internet for that purpose in the newspaper holding company. Only if an electronic information service satisfies a specific interest in one of the environmental segment it has proven to meet a need.

The limited relationship between environmental uncertainty and the use of electronic information services can be caused by a mismatch between information supply and demand. Simply put, there is hardly any relationship, because the information services can not be used to solve environmental uncertainty, because they don't provide content on the relevant environmental segments. Within the professional services industry we clearly saw such a mismatch. The present information supply does not fit with the information needs of the various disciplines. Especially the lack of available market information is remarkable; many use the internet to get this (especially the consultants), but it doesn't suffice. Also, there is too much focus on the professional knowledge in the information supply to auditors (their information needs are much more diverse) and too little focus on professional knowledge in the supply to management consultants.

In other industries it becomes evident that the relationship between environmental uncertainty and use is blurred because of a lack of **capability & accessibility**: maybe there is a clear need for information and users are willing to use electronic information services to satisfy these needs but they simply can't. This is most obviously the case within the newspaper company. Many want to use the internet, but don't have (easy) access to it because of the restrictive policies of the organization. They can only use it at home, or at a dedicated PC on the work floor or don't know how to get a connection. Within the TV News organization time constraints are essential; when the use of electronic information services fit in their tight time schedules they can be used (because of easy accessibility or fast results), otherwise they are ignored. Capability is also an important barrier in the horeca and the garment & clothing industry. They are presently using traditional information sources to satisfy their information needs on the organizational environment: there are strong correlations between interest in the organizational environment and traditional environmental scanning. But the organizations are not yet able to (also) use electronic information services in this process. This capability becomes manifest in **organizational variables** such as size – an organization needs a certain scale to incorporate the use of electronic information services in its

work routine – and IT maturity – they need to be accustomed to a certain degree of automation and informationalization in their organization.

Other perceptions of **accessibility** – whether respondents believe these services are easy to use and not too time consuming – seem to matter less. People are not worried about accessibility as a barrier, although non-users have a more negative perception than users do. Also, the experience a person has with electronic information services matters (in fact, this is the only **individual characteristic** that has proven to be relevant in our analysis). It is also important to note that electronic information services are considered the least accessible information source for environmental scanning. In an organization as 1-of-6 this has nothing to do with a lack of affinity with information and communication technology, because their internal information and communication network (Lotus Notes) is considered the most accessible source of information. Physical accessibility – simply not being able to get access – is a real problem in some organizations because of chaotic infrastructural policies or simply because the organization denies access to certain services for certain people. Within an organization like 1-of-6 it is suggested that the integration of electronic information services within their Lotus Notes network could increase accessibility and can thus encourage more usage of these services. This might very well be true for the other organizations with their own ICT infrastructure.

Sometimes users may want to use electronic information services for environmental scanning but they are not aware of the availability of these services in their organization or even of the possibilities of these services for environmental scanning. **Lack of awareness** (part of accessibility) is mentioned by the non-users as the most important reason for not using any of the electronic information services with accessibility and relevance lagging behind. Both users and non-users complain about the **lack of information** (part of organizational characteristics) on the possibilities of these electronic information services within their organizations.

**Intermediate usage** by information professionals (like librarians or researchers) is only in a very limited sense an alternative for direct use of services. Only the higher management layers in an organization frequently use intermediaries instead of using these services themselves. The reach (amount of people using these services) of electronic information services does not increase among the rest of the organization because of intermediate use: only people who are themselves using the electronic information services do sometimes ask others to search for them. Furthermore, they normally do not ask employees of the corporate library or knowledge centers but direct colleagues. The role of the librarian in this process is limited because they are not sufficiently involved in the primary process, either because they don't know enough of the content of the tasks (as seems to be the case in the professional services industry) or it takes too much time to mobilize them.

Corporate libraries and knowledge & research centers can play an important role in creating policies for knowledge management, in lowering the barriers for usage – especially making people

aware of the possibilities, helping people to increase their capabilities and trying to match the information supply with the needs of their colleagues.

According to our research, they will find fertile grounds in their organizations for an increase in the use of electronic information services. Most respondents have high expectations of the **effects** of electronic information services for their job performance and the organization as a whole. Users see that their own information behavior has become more efficient and effective. They don't believe the use of electronic information services will lead to more innovation, because the present services hardly contain unique information or information they can't find anywhere else. But they do believe they are becoming more market- and client-focused and they believe this will benefit the organization as well.

With our case studies we tried to close the research gap between the needs of environmental scanning and the use of electronic information services. A gap that was caused by the focus in most studies on the relationship between individual characteristics and technology. We therefore expanded the horizon by taking the organization into account. And it is clear, the organization matters. The cases differ much among themselves in the relative importance of the different variables. In each organization, different variables are important in explaining the use of electronic information services. In some organizations accessibility is more important than in others, in other organizations intermediate usage is a real alternative, in others it isn't. The organization matters in such a degree that we hardly see any relationship with individual characteristics anymore. But the gap between needs and use remains. For many different reasons, electronic information services are simply not as suited for environmental scanning as they theoretically could be.

