The outside in: questioning the use of electronic information services in organizations
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Opening up horizons
Summary and conclusions

Our research project on the use of electronic information services has come to an end, for now. We have been shooting on a moving target that has changed rapidly, especially concerning the technological characteristics of electronic information services, and the emergence and the very fast and widespread adoption of internet. Nowadays, the World Wide Web of the internet is widely used at home and at the office, the graphical interface and the distribution mechanisms have become the standard for providing online, electronic information services and publishers are steadily increasing their internet revenue shares.

This research project is however not predominantly a study on the possibilities of specific types of information and communication technologies. It is a study on the interaction between organizations and their external environments, focused on the way in which people in organizations try to gather information about the outside world. In this concluding chapter, we will first summarize the most important results of our research project, focusing on the more structural dynamics and patterns that influence the role of electronic information services in environmental scanning. We will then highlight some of the major changes that have occurred since we have finished the collection of our research data (in 1998) and discuss the impact it might have on our findings: if we would repeat our research today, would it yield completely different results? Finally, we will elaborate on the impact our results might have on theory building, empiric research and business practices.

8.1. Summary of research results

The central question to our research is which role electronic information services can play in environmental scanning processes and which factors affect the actual use of electronic information services within organizations. We have defined environmental scanning as the activity of gaining information about events and relationships in the organization's environment, the knowledge of which would assist management in planning future courses of action (see chapter 2). Electronic information services can be a source of environmental scanning, because they provide access to information about the organization's external environment. Electronic information services can be distinguished from other sources of environmental scanning by two measures: (a) information and communication technologies are used throughout the entire process of the information value chain, and (b) electronic information services have limited interactivity – they only allow consultation of
sources (but they can be integrated with more interactive information and communication technologies) (see chapter three).

In essence, the answer to our central question is that electronic information services can play an important role in environmental scanning but many organizational factors can hinder the use of electronic information services. Our main conclusions are:

- **Environmental scanning contains both the acquisition, sharing and interpretation of information.**
- **Information and communication technologies increasingly enable these three functions of environmental scanning, because of developments in integrating various services and applications and because many technological developments have the potential of making it easier for individuals to use electronic information services, to make interactivity accessible.**
- **Previous research has focused on media characteristics (especially a lack of accessibility and the necessity for intermediate usage) and user characteristics (especially unfamiliarity). The organizational context has been underexposed.**
- **Yet, we argue the organizational context is very important for usage, concerning both the organizational context of suppliers and users.**
- **The supply-side is still very fragmented and not transparent for the user, despite the possibilities that information and communication technologies offer to open up the information value chains.**
- **Among the users, different organizational contexts have highlighted various factors that can hinder the use of electronic information services. Organizations can lift barriers for use by increasing awareness, accessibility, alternatives (especially intermediate usage for managers) and availability (of especially marketing & sales information).**

Let us shortly elaborate on our main conclusions by giving a short summary of our theoretical and empirical findings. The first two chapters give a theoretical viewpoint on how electronic information services can be used. They can be used in the processes of environmental scanning because – by definition – electronic information services provide information on the external, organizational environment. Potentially, electronic information services can therefore be of great value to organizations, because – as we have argued in chapter two – the external environment is of vital importance to the success and the survival of organizations. The external environment consists of all elements that exist outside the boundaries of the organization and that have the potential to affect all or part of the organization. To grasp the abstract concept of the external environment, we have distinguished ten segments of the external environment (like suppliers, market/clients, competitors, technology, regulation, financial markets, etc.). Most theories emphasize the strategic importance of the external environment but as we have seen in our case studies for many the external environment is also of great operational value. In especially knowledge-intensive organizations, a lot of employees need external information to perform their tasks. Environmental
scanning is thus important from the operational to the strategic levels of an organization, although some organizations and some individuals within these organizations will feel a greater need for environmental scanning because they experience more environmental uncertainty.

Environmental scanning involves not only acquiring external information by individuals but also the sharing of this external information internally to aggregate it from individual intelligence to organizational intelligence and applying this intelligence to increase organizational performance. Environmental scanning is thus part of knowledge management practices that focus on integrating various forms of knowledge in an organization and enable this knowledge to be shared.

Information and communication technologies increasingly enable the sharing and application of external information, because of developments in integrating various services and in increasing accessibility. We have seen in chapter three a great variety of electronic information services that facilitate the acquisition of external information. We have distinguished source databases from reference databases, retrospective and real-time services, current awareness and archival sources, offline and online, etc. etc. Internet has been a catalyst for many technological developments in the area of electronic information services. First by making interactivity more accessible. Technological developments make it easier for people to take an active role in the information value chain instead of just consuming pre-packaged units of information. Standardized distribution mechanisms and user interfaces are an example of increased technological accessibility. Secondly, the internet has enabled an integration of various services, such as the combination of consultation with allocation (alerting technologies) and with conversation (communication technologies, such as e-mail and chat). We also highlighted the integration of electronic information services with each other (portals), the integration with internal networks (Intranet) and the integration with external networks (online communities). All these developments are helping to make interactivity accessible and are helping electronic information services in meeting the demands of environmental scanning (especially sharing and applying external information).

Although electronic information services can be used for environmental scanning, the chapters on the actual use show that many barriers exist between need (for scanning) and use. Chapter 4 has focused on existing research, chapter 6 focused on provider’s perspectives of use and chapter 7 on organizations and industries in which electronic information services can be used. According to existing research, the use of electronic information services is predominantly determined by media characteristics, such as accessibility and quality. Existing research shows ambivalent results on the importance of environmental uncertainty: there is a clear relationship between environmental uncertainty and environmental scanning, but a much less clear relationship between uncertainty and the use of electronic information services. It seems these services are not suited for uncertain situations, because they are not accessible enough for managers and small- and medium sized corporations (who experience higher degrees of uncertainty) and they only allow for very systematic searching (knowing what you want to know), which is very difficult in situations of high uncertainty. Another very controversial topic has been the advantages and disadvantages of
intermediate usage; some believe it is a necessity— you need to be a skilled user to be able to efficiently and effectively search these databases — others believe you end up with an unnecessary gatekeeper who doesn’t know enough about the business and who again mainly allows systematic searching. A remarkable blind spot has been the organizational context: hardly any attention is given to organizational effects and ambivalent results exist about the relationship between organizational characteristics (such as size) and the use of electronic information services. We do believe this organizational context is important in understanding the use of electronic information services and have looked at both the organizational context of suppliers (focusing on their information value chains) and of using organizations (focusing on factors that correlate with use of electronic information services). We would expect that because of technological developments, such as the standardization of user interfaces and the growing experience of users with the internet, the relative importance of technical accessibility might be decreasing.

As we have seen in chapter 6, the supply side is organized in a fragmented and not transparent matter which we believe severely limits the accessibility and usability of electronic information services. Many electronic publishers are traditional paper tigers who are hesitant to aggressively promote electronic information services, focus on existing information in a new package and not on new opportunities like production on demand, interaction and transaction possibilities and application-based services. Many other electronic publishers started as an internal department who only saw external clients as an attractive cash generator. The market of electronic information services is also very fragmented: most choose vertical integration of the information value chain with hardly any integration of services (like portals) and hardly any convergence with other publishers or other sectors like IT or consultancy.

Representatives of the electronic publishers we interviewed, also had vague definitions of their target customers and they mostly target intermediaries, of whom they themselves believe they are the biggest obstacle for widespread use of their services. Electronic providers were also unwilling or unable to lower the barriers of financial accessibility (e.g. high usage fees, complex fee structures), technical accessibility (e.g. difficult search engines) and cognitive accessibility (e.g. limited personal contact and/or helpdesks). Their focus has been on using the internet as a means of distribution and on implementing proven, standardized technologies. Finally, they put little priority in emphasizing the applicability or the usefulness of electronic information services; there is hardly any consultative selling, focus is on comprehensiveness (and amount of information) and the searching process and not on processing and applying this information in individual tasks. Publishers are not yet capable of offering electronic information services in such a way that they fit perfectly in the processes of environmental scanning; they make tons of information available for acquisition, but don’t help much in sharing and applying the information.

Chapter 7 has shown that the role of electronic information services in environmental scanning is still rather limited. Because, although many use to some extent electronic information services and although environmental scanning is considered important across all cases, there is a very limited
relationship between the interest in information about the organization's external environment and the use of electronic information services. We have emphasized that the organizational context matters a lot in this sense, which is why we see so many differences between the various organizations in the professional services industry, the media industry, the hotel & restaurant industry (horeca) and the garment & clothing industry. Let's see how the results of our case studies help us in making sense of the lack of relationship between interest in the external environment and the use of electronic information services, taking our general model of analysis as a starting point (see figure 8.1).

First, we have to state that electronic information services are no longer obscure in most organizations. These services used to be difficult to use and only used by a few. With the emergence of the internet this is no longer the case; many are now at least slightly familiar with searching and retrieving electronic information. Most theories that focus on the influence of individual characteristics on use are becoming less relevant. In fact, in our case studies, we hardly saw any relationship between individual characteristics and the use of electronic information services.

Second, the organizational environment is omnipresent. For some in a strategic sense, for others in a very day-to-day operational level (and for strategic managers, strategy is part of daily operations). Almost everybody we surveyed experience high interest in the external environment or segments.
of it. On an environmental level and organizational level, we don't see much difference between the organizations in interest in the external environment – apparently the external environment is important to some extent for everybody – and we don't see much difference in the use of electronic information services across the different cases.

But the organizational context does matter, because in each organization different circumstances exist that influence the use of electronic information services within these organization. We first investigated for whom in an organization, the organizational environment is relevant, who are the boundary spanners in the organization? This varies from a few percent of the employees in the garment & clothing industry (especially management) to almost everybody in the professional services industry. Furthermore, electronic information services are more useful in operational tasks than in strategic tasks. That's probably why we didn't see any correlations between the general interest in the external environment and usage, but we did see some correlations between the specific interest in segments of the external environment and the use of electronic information, such as the use of legislation databases for fiscal advisers or the use of internet for ICT-information for the ICT-employees in the newspaper holding company. So, in order to understand the use of electronic information services we probably first have to look for those boundary spanners that need external information for their operational tasks. A close look at the primary process of an organization should give an indication on whether electronic information services are actually used.

Furthermore, the use of electronic information is strongly correlated with the availability of alternative sources of environmental scanning, like colleagues or print media. Intermediate usage (especially by colleagues in the same primary processes and in a few cases information professionals like corporate librarians) can be such an alternative as well. In the larger and more knowledge-intensive organizations, intermediate usage/colleagues are an alternative for especially the higher management levels who can delegate information acquisition tasks to more junior employees. In the less knowledge-intensive organizations, traditional print sources often suffice.

Also, the use of electronic information services is hampered by a lack of availability of the right electronic information services or a lack of awareness what kind of services or information exist. We have seen this to be the case in especially the professional services industry with market information (concerning clients, competitors and industries). Chapter six explains in part why this lack of availability exists: the fragmented information industry is often not able to provide a coherent and transparent market supply of electronic information to the crucial boundary spanners in an organization. They traditionally focus on closed information value chains (which results in fragmentation) and they traditionally target corporate librarians who are often not the best boundary spanners in an organization.

Chapter seven also shows that accessibility can severely be limited by a passive attitude of organizations. Many respondents believe external information is very relevant and almost everybody is very positive about the possible effects electronic information services (can) have on their own performance as well as on the performance of the organization as a whole. Yet,
management has been very reluctant to take an active position in the adoption processes of electronic information services. Users and non-users perceive the accessibility of these services to be sufficient (it doesn't take too much effort to (learn to) use them), but they criticize the limited ways in which these services are made of use within the organization.

So, the use of electronic information services doesn't correlate much with the general interest in the external environment but does correlate significantly with specific interests in environmental segments. Environmental scanning and the use of electronic information services is not only a strategic matter, but foremost an operational one. Although the use of electronic information services doesn't correlate much with individual characteristics, task characteristics are very important (the role of external information in the primary processes). The user-friendliness of ICT's is not a big issue (anymore?), but accessibility still is. This accessibility does not so much depend upon the technical characteristics of the electronic information services but mostly upon the extent to which providers are willing to open up their information value chains to allow more interactivity and more transparency and upon the extent to which using organizations are willing and capable of building an internal information value chain upon these external electronic information services in order to allow the internal sharing and application of external information. Organizational characteristics such as size and age do not really matter but IT maturity, knowledge management policies and the availability of colleagues and other alternative sources do correlate nicely.

8.2. Times are changing

Much has changed in our research area since we finished our data collection (in 1998). Especially in the availability and use of information and communication technologies, we have seen many developments. Not so long ago, internet was just a difficult to use UNIX-based computer network for the academic community. Videotex was heavily promoted in France (Minitel) but failed to attract large groups of customers in the rest of the world. Many electronic information services were at best exotic - or worse: obscure - with low accessibility and high prices. Many argued that you needed information professionals to skilfully use electronic information services. This actually means, you had to go through four years of college to be able to use the different command languages.

Nowadays, the internet (and the World Wide Web) are widely used at home and at the office. Recent figures (NielsenNetratings, 2003) show that over 9 million persons over 16 years of age have access to the internet, representing 72.4% of the Dutch population. Six million of them are active during a particular month (e.g. in April 2003). At the end of 2001, 76% of all companies (in absolute numbers: 465,000) in the Netherlands had access to the internet. Almost every company with a PC, also has access to the internet. Just about 10% of the companies have their own Intranet and this figure has been relatively stable over the last three years (Nipo Interactive, 2002). Internet is clearly becoming omnipresent, both at home and at work. Also, mobile technologies are providing new distribution mechanisms to provide information anywhere and anytime. Devices like
handhelds or personal digital assistants (PDA's) will be used, especially to alert users for important events and developments.

Much has also changed with the publishers. Elsevier has heavily invested in Science Direct putting all academic magazines online. VNU has sold their consumer magazine division which enabled them to buy Nielsen. VNU is now solely focusing on providing marketing and media information to the business community. Wolters Kluwer has invested in internet portals and software companies to create smart information tools, integrating content into intranet plaza's and workflow management systems. All claim that by now at least 30% of their revenues are from electronic services, such as cd-rom and the internet.

In theory, the organizational context has gained importance. The discipline of knowledge management has emerged which focuses on how to manage both tacit as well as explicit forms of knowledge in the organization and especially on how to guarantee that knowledge is shared within the organization. Another important emerging theme has been Customer Relationship Management (CRM). CRM focuses on managing all of the ways that a firm deals with its existing and potential new customers. CRM is both a business and a technology discipline that uses information systems to coordinate all of the business processes surrounding the firm's interactions with its customers in sales, marketing and service (Laudon & Laudon, 2002). CRM is an example of the focused and structured way in which an organization can deal with one of the most important segments of the organization's external environment – the customer.

So, much has changed and there are many developments that may expand the role electronic information services can play in environmental scanning. But, without denying the profoundness of these changes, we also should not exaggerate. Technology has changed a lot, but technology isn't the most important factor of the limited role of electronic information services. Internet has become a commodity and a mass product, but it is unclear how much it is used for professional purposes - the majority of users have access for private reasons. For example, Only 21% of all internet users, use the internet at work (Nipo interactive, 2002). The importance of the organizational context in theory has increased but still one seems to concentrate on the internal organization instead of the interaction with the outside world. Publishers are using the internet as a new distribution mechanism but products and services are still supplied in a fragmented manner.

If we would repeat our case studies in 2003, we would probably see much higher penetration rates for the internet and maybe also for other electronic information services, but still 27% of all notaries in the Netherlands never use the internet to search for legal information (and 35% of them never use a cd-rom). For lawyers it is still 9% who never use the internet and 11% who never use a cd-rom (Discr ipt, 2003). Our cases were the frontrunners in the use of electronic information services: 100% of the lawyers in our case studies in 1997 already used electronic information services.
Intranet, knowledge management and Customer Relationship management have emerged as important business themes, but we do see that in practice, these disciplines focus on managing the internal organization. Knowledge management focuses on ensuring internal knowledge to be spread around the organization. A principal use of the intranets has been to create online, always up-to-date repositories of internal information that can be made more widely and universally available within the organization. CRM focuses on the customers, but many firms are occupied with consolidating customer information from multiple communication channels – the call center, e-mail, the Web, mass media, retail and other distribution channels – therefore focusing on an integration of what is already known within the company (not outside the company).

Publishers have changed, many of them now also provide online products and services, but it has proven to be very difficult to optimally profit from the flexibility that ICT's enable in the information value chains. Many have used the internet as a new distribution channel to sell their content or as a new package format for existing content (see also: Wildvank, 2003). Most publishers struggle to generate new revenue streams with online information: most provide information for free in the hope it creates an appetite for more (chargeable) content (see also Discrpt, 2003). They have not fundamentally changed the way they do business: there are still few alliances with organizations from other industries (like software, consultancy, etc.) and there's still more conglomeration, publishers are still cautious in really altering the information value chains, and allowing customers to make their own selections, to download and to integrate bits and pieces within their internal networks.

The point made is that technological developments and the penetration of these technologies have been impressive. But it takes time before new technological opportunities are grasped. And it takes time before technologies are mature enough to meet the demands of the using organizations. It takes even more time before the impact of these opportunities on the way we work and live becomes visible. The impact of the use of electronic information services on organizational intelligence and the interaction between organizations and their environments is probably still limited and may only become visible in the years to come.

The structural dynamics that are the basis for the limited role that electronic information services play in environmental scanning have not disappeared or dramatically changed because of technological improvements. This research project points to some of these structural dynamics, like:

- Knowledge about the outside world is at least as important as internal knowledge and ICT's can help to acquire and share this outside knowledge, yet technologies are mostly used to structure the internal information flows.
- Publishers are moving towards internet and other electronic information services and try to play a role in the knowledge management practices of their clients. But they clearly face difficulties in their transaction from a paper tiger to an electronic service provider, because
the market is still fragmented in closed information value chains (no one-stop shopping portals with various publishers participating) and there is still hardly any consultative selling.

- Users have difficulties in defining their external information needs and organizations have difficulties in organizing their internal information chains to satisfy these needs and to make this information truly accessible. Knowledge management, CRM and the development of intranets still focus mainly on internal information sources.

These structural dynamics have to be taken into account to enable the recent technological developments to fulfil their promises and to increase the role of electronic information services in environmental scanning.

8.3. Theoretical implications of research results

The results of our case studies do help us to get a better understanding on the use of electronic information services and what it's role in environmental scanning can be and actually is. In theory electronic information services can facilitate environmental scanning processes but in practice the organizational context interferes. Because of this, the use of electronic information services is not as high as could be expected from the (high) interest in segments of the organization's external environment. The organizational context refers both to the information value chain of the suppliers of electronic information services (the electronic publishers) as well as how this information value chain can have an internal continuation and adaptation in the organizations that use electronic information services.

In chapter two on environmental scanning, several concepts were introduced that could be of influence on the extent of environmental scanning and the process of environmental scanning. The results of our case studies and interviews with electronic publishers give indications that we need to redefine some of the central concepts of our theoretical framework and re-assess the relevance of some of these concepts for the use of electronic information services. First, a redefinition of environmental scanning is needed. In chapter two we quoted Choo & Auster (1993) who defined environmental scanning as the "activity of gaining information about events and relationships in the organization's environment, the knowledge of which would assist management in planning future courses of action". Although this definition can be interpreted as including both gathering, sharing and interpreting information, especially the part of sharing is underexposed in this definition. The most important adaptation of the definition is required in its focus on management. The definition seems to imply that environmental scanning is foremost a strategic activity that is relevant for managers. Our case studies show that this is not the case. It is true that managers report high interest in the organization's external environment and a high amount of usage (especially if this includes intermediate usage). But this is not only true for managers. For many employees in the organizations - especially those of the professional services industry and the media industry - environmental scanning and the use of electronic information services is very relevant for their daily
operational work. The outside information flows in the organization at all levels and positions. The organization's external environment is no longer – if it ever were – of solely strategic relevance exclusively for managers. Environmental scanning should therefore be defined as the process of gathering, sharing and interpreting information about the organization's external environment in an organization, the knowledge of which would assist employees to take action upon it.

Partly as a consequence of this updated concept of environmental scanning, we also need to redefine the main underlying dimension of another general concept of our dissertation: environmental uncertainty. Environmental uncertainty is said to be mainly caused by environmental complexity and environmental dynamics. Environmental complexity relates to the amount of environmental factors that need to be taken into consideration and the degree to which these factors are dissimilar to one another (Duncan, 1972). Environmental dynamics concerns the degree to which these factors change over time. The underlying assumption of especially environmental complexity is that the more factors one needs to consider, the more uncertain one will perceive the organization's external environment. This is probably true if environmental uncertainty is only a relevant concept for managers dealing with strategic issues, but most employees have specialized in a few segments of the organization's external environment and can still experience a very high degree of environmental uncertainty concerning their tasks. Uncertainty concerning the overall external environment is probably only relevant for managers. For most other employees, segmental uncertainty (related to only those segments that are directly relevant for their operational tasks) is much more relevant in explaining their environmental scanning behaviour. In our case studies we measured the interest in the organization's external environment (as an outcome of environmental uncertainty) as the average interest in all segments (or a few dimensions of it). This proved not be helpful in explaining the use of electronic information services. High interest in specific segments often correlated much better with usage. Because of the increasing importance of the organization's external environment for an increasing number of organizational members, we need to redefine the concept of environmental uncertainty to be able to take into account these specialized forms of uncertainty.

Another problem with perceived environmental uncertainty as a concept may be that it is no longer discriminative enough. Because the external environment is increasingly becoming relevant for many employees in the organization, more and more people will experience high levels of environmental uncertainty. In our case studies, we measured high levels of uncertainty throughout all cases and we could not find many differences between the organizations and industries (even managers in supposedly simple and stable environments as the hotel and restaurant industry reported high levels of interest in the organization's external environment). If the external environment is relevant for many organizations and many employees within these organizations, many will express a high degree of environmental uncertainty which will cause too little variation to explain differences in environmental scanning and the use of information sources (including electronic information services).
In chapter two, the relevance of environmental scanning was not only explained by the concept of environmental uncertainty, but also by strategic focus and performance goals (such as effectiveness, efficiency and innovation), organizational characteristics such as size and age and the position of the boundary spanners in primary processes and organizational structures. Many of these concepts were difficult to investigate, because they were hard to operationalize. Many large organizations state different performance goals and experience different growth rates for different departments or business units and employees find it difficult to prioritise the different performance goals and to differentiate between goals of their own work, their own department and/or the organization as a whole.

But the organizational context is important because in every organization different factors caused a limited use of electronic information services despite high levels of environmental uncertainty. From our surveys it was especially clear that knowledge management policies to increase awareness about, and accessibility and availability of electronic information services, correlate heavily with the use of electronic information services. In one organization, accessibility was a problem, in another the IT infrastructure, in another the many alternatives for using electronic information services and in again another organization a mismatch between demand and supply (of especially market information). Also, we expect that the concept of boundary spanning will become more relevant. Boundary spanners have to be central in the organization's processes and structure to truly be able to get the outside information in and distribute it within; professional information intermediaries like librarians are often not in that position, direct colleagues are.

In chapter three and four we focused on the concept of accessibility and rightly so as the results of our case studies show (although electronic publishers downplay the relevance of it). But accessibility should not be limited to technological features and how easy it is to use these technological features. Accessibility does not equal user friendliness. Accessibility can be improved through all stages of the information value chain of the electronic providers, but also by the efforts of the using organizations to integrate electronic information services within internal primary processes. Organizations need to create an internal value chain to increase the use of electronic information and its possible effects on organizational performance.

We found many results that contradict with existing research as we have studied them in the meta analysis (see chapter 4). The meta analysis placed much emphasis on individual characteristics, we didn't see any evidence of this relationship (except the importance of task characteristics). The meta analysis placed much emphasis on technical accessibility, wrongly so. It is not so much the technical features that matters. It is not the atomised human-computer interaction that is relevant, it is the organizational context in which this happens that matters. The meta-analysis showed ambivalent results on the impact of intermediate usage by especially professional intermediaries such as corporate librarians. Our case studies show that professional intermediaries only play a limited role in the use of electronic information services but intermediate usage by colleagues can be important. The meta analysis showed a strong relationship between environmental uncertainty
and environmental scanning and an ambivalent one between environmental uncertainty and the use of electronic information services. We saw the same thing. Where measured, environmental scanning correlates nicely with the interest in the organizational environment. But, we have to realize that almost everybody feels some form of environmental uncertainty and even very specific and limited forms of uncertainty can be a strong motive to use electronic information services. The meta analysis showed that the organizational context was often disregarded, wrongly so. Our case studies show that organizational context makes all the difference.

8.4. What's next?

Electronic information services play a limited role in environmental scanning, because they are not always fully suited for the demands of the environmental scanning process and users experience many barriers for use. The limited role of electronic information services might become problematic in the near future. As organizations are getting more porous and boundaryless, are getting more open to the organizational environment throughout all layers, they hardly have the right tools to structure the information flows with the organization's external environment. We have learned to analyse thoroughly the internal information flows and how they can be canalised with information and communication technologies. Organizations are far less skilled and experienced in absorbing the external information that flows from the outside in. This is a remarkable situation, because the outside world is of vital importance for the success of an organization.

In order for organizations to be able to deal with external information, organizations need to open up their worlds. At present, information value chains are very strictly organized and seem to stop at the boundaries of the using organization. Electronic publishers have created rather traditional – and thus linear – information value chains that produce pre-packaged units of information products. Organizations let the information products be picked up by traditional gatekeepers such as corporate librarians and experience many difficulties in disseminating the information internally to create organizational intelligence about the organization's external environment.

To increase the role of electronic publishers and thus to help organizations deal with the increasing pressures from the organizational, external environment, suppliers have to put their information services in an organizational context. They have to allow information chains to converge and diverge and enable users to combine acquisition with sharing and application tools. They need to allow clients to incorporate electronic information services with their internal information infrastructures. Also, electronic publishers need to open up their information chains by forming alliances with other publishers, service organizations, ICT facilitators and user organizations to create a coherent, comprehensive and transparent supply of information. Electronic publishers can help users not so much with using the technologies but foremost with structuring their information needs concerning the organization's external environment. They can advise clients on how electronic information services fit with the client's knowledge management policies, practices and
ambitions and how these service help in canalising the interaction between organizations and their external environments.

In our view, the organizations that want to use electronic information services need to open up as well. The environment is no longer – if it ever were – only of strategic concern and no longer only a managerial concern. Information about the organization's external environment is important for many in the organization and in daily operations. Organizations need to take an active position and need to increase the accessibility of electronic information services. It will mean that electronic information services need to be available for many in the organization, preferably directly or otherwise through intermediate usage. Organizations need to be able to create their own, internal information value chains on top of the information products and services that are delivered by electronic publishers. This means that electronic information services need to be integrated with other sources of acquisition and – more important – with internal networks to enable sharing of information and integration with the primary processes and applications for this information to be fully taken into account in daily decision making and operations. Organizations have to actively make employees aware of the availability of information about the organization's external environment and the possibilities of electronic information services to improve their knowledge. They have to educate and stimulate people how to actively search, share and interpret information about the organization's external environment.

Future research can help to increase the role of electronic information services in the interaction between organizations and their external environments and help organizations with canalising their information needs concerning the external environment. We can mention a few interesting research areas in this field.

First, it needs to be clear if it's worth the effort. Information and communication technologies as the internet have become a commodity and are widely used. But do they now also help in increasing organizational intelligence about the outside world? By now, the effects of use must be more visible – how does it improve the efficiency and effectiveness of information behaviour and foremost how does it increase individual work performance. Also, it would be very interesting to incorporate recent organizational and technological developments in these studies of effect. Since we finished our case studies, knowledge management has become a popular and influential discipline and it is interesting to see how electronic information services have created a position in it and to what effect.

Second, one of the problems we have discovered in the supply of information has been the lack of available market information, concerning clients, other companies and industry information. The emergence of especially customer relations management (CRM) has created a burst of client information. The emergence of CRM is very interesting, because it deals with one of the most important segments of the organization's external environment – clients. Also, one of the central aspects of CRM is to create a meaningful and reciprocal interaction between organizations and its clients. Organizations want to be able to adjust to the habits, preferences and peculiarities of
individual clients or groups of clients to optimally serve its customer base and create a competitive
advantage. And they want to give special attention to the most loyal and profitable customers. This
implies that a strong CRM policy requires a powerful information infrastructure from which
organizations can create knowledge about who are the most loyal and profitable customers and
what preferences they have. Because of the popularity of CRM, many companies have created
data warehouses with important customer information. The pitfall of CRM and database marketing
however may be that companies are too much focusing on internal data, on what is already known
about the customers they already have. CRM does have the potential of integrating both internal
data (transactions per customer, contact preferences, etc.) and external data (for example zip code
information of customers or market research information). It is interesting to see to what extent
electronic publishers are capable of providing meaningful input to the CRM activities of companies
and to what extent companies use also external data to inform themselves about the most
important segment of the organization's external environment – the client.

Third, from the supply-side we have put much emphasis on making the information value chains
more flexible. Future research could focus on the impact of this flexibility; do providers really allow
and users really demand any form of convergence or divergence of the information value chains?
Do publishers really build a central platform for acquisition and storage and do they build multiple
value chains with different services for different groups and do they really allow users to create their
own value chains based upon the services electronic publishers provide? It is also interesting to
investigate how strategic partnerships can help to create more flexibility in the information value
chains. One could especially focus on partnerships with other electronic publishers, with ICT
facilitators, with knowledge management or marketing consultants and – also – with clients. Do
publishers already cooperate with users and how do they help each other in profiting from this
information? Finally, how do organizations cope with building their own information value chains
within general knowledge management practices. How can this be done and how should it be
organized? Does it help in the interaction between organizations and its environments?

In the end, this dissertation is not meant to promote the use of electronic information services. If
they are not suited for the job, we do not recommend using them in organizations. But if they can
help in structuring and improving the interaction between organizations and their environments,
they can have an enormous impact in the business environment. Because the only organizations
who will survive or who will have a competitive edge over others, are the ones who are best in
satisfying the needs of the organization’s external environment.