

# Working with information: information management and culture in a professional services organization

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## **Abstract.**

The paper presents a case study of a large Canadian law firm with a distinctive information culture that is vigorously implementing an information management strategy. Our findings suggest that, at least for this organization, information culture trumps information management in its impact on information use outcomes. Thus, the strongly held information values and behaviors in the firm accounted for more than one-third of the variance in information use outcomes. Employees did perceive a high level of information management activity in the firm, although information management played a smaller, perhaps indirect role in explaining information use outcomes. What might organizations do to improve information use? This study suggests that organizations might do well to recognize that, in the hustle and bustle to implement strategies and systems, information values and information culture will always have a defining influence on how people share and use information.

**Keywords:** information management; information culture; information use outcomes

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## 1. Introduction

This research is a study of information management and information use behaviors in a knowledge-intensive organization. We look at a large professional services organization where the ability to find, share, and process information is critical to its operation. We consider information behaviors as lying at the intersection of three sets of influences: information management, information culture, and information use [1–3]. By information management, we refer to the formal approach made by an organization to maximize the availability of useful resources to solve individual and organizational information problems [1, 4, 5]. By information culture we mean the socially transmitted patterns of behaviors and values about the significance and use of information in an organization. By information use, we are interested in how people select and apply information as they perform their work, make sense of their worlds, and enact their organizational or professional roles [6–8].

Our research questions thus include the following. What are the information management policies and strategies being adopted by the organization? What information behaviors and values underpin information practices in the firm? How do members perceive the outcomes of information use in their work contexts? What effect do information behaviors and values have on the use of information and its outcomes? Information management, culture, and use are hard to define concepts, so a secondary objective is to explore methods of ‘measuring’, however tentatively, and salient features of these phenomena in order to allow a more systematic analysis.

## 2. Literature review and conceptual framework

In this paper, our conceptual stance is to analyze organizations as information use environments (IUE) [5, 9]. This approach focuses on the user, the uses of information, and the contexts within which users make choices about what information is useful to them. These choices are based, ‘not only on subject matter, but on other elements of the context within which a user lives and works’ [9, p. 218]. The information use environment is defined as consisting of

those elements that (a) affect the flow and use of information messages into, within, and out of any definable entity; and (b) determine the criteria by which the value of information messages will be judged. [9, p. 24]

In an organization, the IUE elements would comprise defined ‘sets of people’ (e.g. professionals, managers) working on and resolving ‘problems’ deemed to be important and typical, within contexts that include how the structure, style, culture, history and experience of the organization affect attitudes towards information and information behaviors of employees [9, p. 227]. For the purposes of this paper, we concentrate on information management policies and strategies; information behaviors and values; and information use outcomes.

### 2.1. Information and knowledge management

Information management has been defined as the application of management principles to the acquisition, organization, control, dissemination, and use of information, and is ultimately concerned with the value, quality, and use of information to improve organizational performance [10]. Davenport [11] introduces the concept of an information ecology to examine the key properties of an effective and healthy organizational information environment. The information environment consists of six components: information strategy, information politics, information behavior and culture, information staff, information processes, and information architecture. *Information strategy* addresses the question of ‘What do we want to do with information in this organization?’ It makes clear the intended link between information management and the ability of the organization to achieve its mission and goals. An organization’s information strategy is often expressed in the form of a set of basic principles. *Information politics* arises from the distribution of the power that

information bestows and the governance modes for its management and use. Five political models are identified, ranging from 'feudalism', where business units define their own information needs and report limited information back to the firm, to 'federalism', where there is consensus and negotiation among business units on the use of information. Three important types of *information behaviors* are concerned with: sharing information (making information available to others); handling information overload (making information engaging so that the right people recognize and use the right information); and dealing with multiple meanings (creating a common understanding of concepts and terms used in an organization). *Information staff* includes information content and information technology specialists who design, develop, train and coordinate the creation and use of information. *Information processes* describes how information work gets accomplished through determining information requirements, capturing information, distributing information, and using information. *Information architecture* provides a guide to the structure and location of information within the organization. It can either be descriptive, such as a map of the current information environment, or prescriptive, as in presenting a model of the information environment.

Recent research in the area of knowledge management suggests new ways of looking at information management [12, 13]. One perspective examines an organization as owning a stock of intellectual capital that it uses to create economic value. This intellectual capital includes the expertise and experience of individuals, the routines and processes that define the distinctive way of doing things inside the organization, as well as knowledge of customer needs and supplier strengths. Conceptually then, intellectual capital consists of human capital and structural capital [14, 15], where human capital is derived from the competence, skills and experience of employees, and structural capital comes from the procedures, routines, and relationships the organization has developed over time. From an information perspective, developing structural capital requires policies and processes to be designed that allow the firm to be efficient in creating, storing, accessing, and using information. Developing human capital includes improving information skills and providing information that enables knowledgeable employees to find each other and to share their expertise.

Another perspective in knowledge management contrasts the differences between tacit and explicit knowledge. For example, Hansen et al. [16] studied knowledge management practices at management consulting firms, health care providers, and computer manufacturers. They found two different knowledge management strategies in place: one based on codification, and the other on personalization. The codification strategy focuses on the reuse of explicit knowledge. Knowledge is codified, stored and disseminated through the use of information technology, electronic document systems, and formal procedures. The personalization strategy focuses on the sharing of tacit knowledge. Knowledge is shared through person-to-person interaction that takes place in mentoring, conversations, and social networks. As part of the theoretical framework of the present study, we focus on the information management activities that support both strategies, as well as considering the elements that make up the broader information environment of the organization.

## 2.2. *Information culture*

Information culture is reflected in the organization's values, norms, and practices with regard to the management and use of information [3, 17]. *Values* are deeply held beliefs about the goals and identity of the organization, and how it should go about attaining those goals. These values are often hard to articulate and even harder to change. They provide the answers to questions such as 'What does the organization perceive to be the role and contribution of information to organizational effectiveness?' and 'What values underlie the organizational style of managing its creation and use of information?' *Norms* are derived from values, but have a more direct influence on information behaviors. Norms are rules or socially accepted standards that define what is normal or to be expected in the organization. Norms or rules may be informal or formal. Informal norms and attitudes influence the creation, flow, and use of information in individuals and groups. Formal rules, routines and policies may exist to plan, guide, and control information as an organizational asset.

*Behaviors* are repeated patterns of action that involve organizational roles, structures, and forms of interactions. They describe how people find, organize, use and share information as part of their normal work patterns. Certain organizational practices or policies may act as impediments (or incentives) to the effective use of information.

The link between norms and information behavior is made clear in the analysis of the social and cultural context of information seeking developed by Chatman [18]. Drawing upon her studies of the information behaviors of the working poor, elderly women, prison inmates, and others, Chatman creates a theory of normative behavior to understand information behaviors:

Normative behaviour is that behaviour which is viewed by inhabitants of a social world as most appropriate for that particular context. Essentially driven by mores and norms, normative behaviour provides a predictable, routine, and manageable approach to everyday reality. Aspects of interest are those things which serve to legitimize and justify values, which embody social existence. [18, p. 13]

Although her analysis is framed in terms of the specific social worlds of her study participants, her arguments are generalizable to the social worlds that are constituted by organizational units. Chatman's theory is built on four concepts: social norms, worldview, social types, and information behavior. Social norms create standards to judge 'rightness or wrongness' in social appearances. Norms give people a way to gauge what is 'normal' in a specific context and at a specific time – they point the way to acceptable standards and codes of behavior. Worldview is a collective perception by members of a social world regarding those things which are deemed important and unimportant. Worldview provides a collective approach to assess the importance of information. Social types are 'the absolute definitions given to members of a social world'. They classify persons and in doing so let 'members of a small world have sensible clues to the ways in which to behave, converse, and share information.' [18, p. 12]

Marchand, Kettinger and Rollins [19] surveyed over a thousand senior managers from nearly as many companies operating in 22 countries and 25 industries in an attempt to answer the question 'How does the interaction of people, information and technology affect business performance?' Results of the study showed that three 'information capabilities' combine together to define an organization's *Information Orientation* that predicts business performance. The study concluded that an organization needs to be strong in all three capabilities in order to realize superior business performance. The three information capabilities are:

- Information technology practices: the capability to effectively manage IT applications and infrastructure to support operations, business processes, innovation and managerial decision making.
- Information management practices: the capability to manage information effectively over the life cycle of information use, including sensing, collecting, organizing, processing and maintaining information.
- Information behaviors and values: the capability to instill and promote behaviors and values in people for effective use of information.

As part of our conceptual framework, the present study uses the six information behaviors and values identified by Marchand et al. [19] to analyze information culture in an organization: information integrity, formality, control, sharing, transparency, and proactiveness. *Information integrity* is defined as the use of information in a trustful and principled manner at the individual and organizational level. It defines the boundaries beyond which managers and people may not go in a company. It implies that there are ways of using information that are *not* appropriate and will be sanctioned [19, p. 121]. *Information formality* is the willingness to use and trust institutionalized information over informal sources [19, p. 122]. *Information control* is the extent to which information about performance is continuously presented to people to manage and monitor their performance. Managers use information to monitor and control operational activities and decisions to achieve intended strategy and improve business performance [19, p. 123]. *Information transparency*

is defined as openness in reporting and presentation of information on errors, failures, and mistakes. It permits organizational members to learn from failures, errors, and mistakes [19, p. 124]. *Information sharing* is the willingness to provide others with information in an appropriate and collaborative fashion. This dimension appears to be well recognized by senior managers, particularly as it relates to internal information sharing [19, p. 125]. *Proactiveness* is the active concern to think about how to obtain and apply new information in order to respond quickly to business changes, and to promote innovation in products and services [19, p. 126].

### 2.3. Information use

Information behavior may be defined as the sum of activities through which information becomes useful [9, 20, 21]. The usefulness or value of information is based not only on subject matter or how well the information content matches a query or topic, but also on the requirements, norms and expectations that arise from the user's work and organizational contexts. Information use occurs when the individual selects and processes information which leads to a change in the individual's capacity to make sense or to take action. The information that is eventually used is a very small subset of the total information that is encountered. The outcome of information use is a change in the individual's state of knowledge or capacity to act. Thus, information use typically involves the selection and processing of information in order to answer a question, solve a problem, make a decision, negotiate a position, or make sense of a situation [3].

Taylor [9] identifies eight classes of information uses, based on the information need perceived by users in particular situations, and derived in part from the classification developed by Dervin [22].

- *Enlightenment*. Information is used to develop a context or to make sense of a situation by answering questions such as: 'Are there similar situations? What are they? What is our history and experience?'
- *Problem understanding*. Information is used in a more specific way than enlightenment – it is used to develop a better comprehension of a particular problem.
- *Instrumental*. Information is used so that the individual knows what to do and how to do something.
- *Factual*. Information is used to determine the facts of a phenomenon or event, to describe reality.
- *Confirmational*. Information is used to verify another piece of information.
- *Projective*. Information is used to predict what is likely to happen in the future.
- *Motivational*. Information is used to initiate or sustain personal involvement, in order to keep moving along on a particular course of action.
- *Personal or political*. Information is used to develop relationships; enhance status, reputation, personal fulfillment. Dervin [22] associates this information use with phrases such as 'Got control', 'Got out of a bad situation', and 'Got connected to others'. (Adapted from [9, p. 230].)

The categories are not mutually exclusive, so that information used in one class may also address the needs of other classes. If we focus on the outcomes of information use, we may regroup the above into three general categories relating to:

- (1) Task performance – enlightenment (making sense of a situation); problem understanding; instrumental (knowing what to do).
- (2) Self-efficacy – motivational (sustaining personal involvement); personal (enhancing status, reputation, personal fulfillment). Self-efficacy can be defined as the perception or judgment of one's ability to perform a certain action successfully or to control one's circumstances [23, 24]. Moreover, Bandura [24] showed that perceived self-efficacy is a significant determinant of performance that operates partially independently of underlying skills.
- (3) Social maintenance – personal or political (using information to develop relationships, to 'get connected to others').

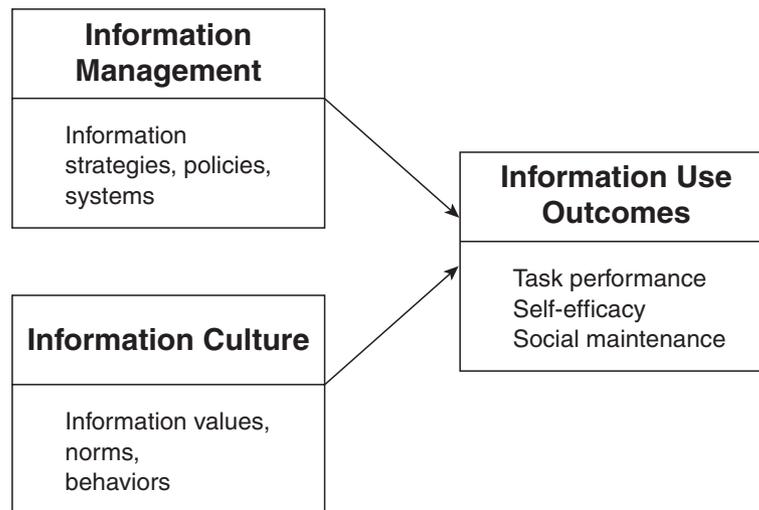


Fig. 1. Conceptual framework: information management, information culture, and information use outcomes.

In a review of process models of group work, Kraut [25] identified three similar categories of group work outcomes:

- (1) Production outcomes are ‘task outcomes’ that emphasize efficiency and effectiveness in task performance. Besides production, groups also need to support the needs of individuals and to foster the capability to work together in a collaborative environment.
- (2) Individual support: group members are satisfied with their work, and there is a sense of achievement, of having an impact.
- (3) Group maintenance.

As part of our theoretical framework, the present study asks participants to report their perceptions of information use outcomes in these three categories.

Figure 1 above outlines the main conceptual elements of our study, and shows the causal relationships that are implicit in the research literature of information management and information culture.

### 3. Method

#### 3.1. Data collection

The primary method of data collection is a questionnaire survey. A survey allows us to reach a broad cross-section of the various groups of people (professionals, support staff, managers) who participate in information work, and to develop a general sense of their perceptions and beliefs about how information is managed and used in the organization. The survey also includes a number of open-ended qualitative questions that ask for more detailed commentary.

The questionnaire contains three main sections on information management, information behaviors and values, and information use outcomes. Most items are presented as statements that respondents indicate their agreement with on a scale of 1 (strongly disagree) to 5 (strongly agree), with a sixth category for ‘do not know’. In the first section (information management) 14 questions were developed from theory as well as from items used in recent surveys on information and knowledge management conducted by the OECD [26] and Statistics Canada [27]. These questions ask about the

information use environment at the general level of the organization, and touch on areas such as information policy, formal procedures, training, and mentoring. Most of these questions are shown in the Results section below.

In the second section (information behaviors and values), 28 questions were adapted from items used by Marchand et al. [19] in their survey on information orientation. Thus, there were items covering information integrity, formality, control, transparency, sharing, and proactiveness. These factors were discussed earlier in the paper, and most of the questions are shown in the Results section below. It is important to note that this research differs in scope and method from Marchand et al.'s information orientation (IO) study [19]. The IO study examined the combined effect of capabilities reflected in information management, information behaviors and values, and IT practices on the business performance of the organization. Its respondents were senior managers who reported on their perceptions of the importance of each set of capabilities. In the present research, we focus only on the part of the IO construct that relates to information behaviors and values. We are interested in how these values may help us to analyze the information-use culture of an organization. We survey everyone in the organization: managers, professional staff, as well as administrative and support staff. Finally, whereas the dependent variable in the IO study was business performance outcomes, the dependent variable in the present study is information use outcomes.

The third section of the questionnaire on information use outcomes is more exploratory. Based on our review of the literature, we developed a set of questions on the general, experienced outcomes of information use as reported by participants. We are interested in task-related outcomes where information is used to solve problems or innovate; self-efficacy outcomes where employees perceive they have an impact or influence; and social maintenance outcomes. Five questions address these outcomes, and these are shown in the Results section below. The last section of the questionnaire collects demographic data on each respondent's job function, job tenure, educational qualification, age, and gender.

The questionnaire survey was implemented on the web and hosted on a server in the Faculty of Information Studies, University of Toronto. Participants accessed the survey remotely via a web page link. They chose to answer either the English or French language versions of the survey. Each section of the survey contained built-in checks to ensure that the section was completely answered before the next section was presented. Responses were entered automatically into a database. Each completed questionnaire formed a record in that database. The database was subsequently cleaned and imported into SPSS for statistical analysis.

In addition to the survey, we gained an understanding of the information management approach at the firm through a number of meetings and interviews with key individuals, the reading of documents, analysis of intranet usage, and site visits. We draw on three sources in particular: (a) interviews with the Chief Knowledge Officer and senior partners responsible for the firm's information management and professional development activities; (b) an examination of the firm's handbook on professional excellence and related documents on knowledge and information management; and (c) observation and analysis of the use of the firm's intranet.

### *3.2. Research site*

The study site is one of the largest Canadian-based national law firms employing over 2000 professionals. With offices in major cities across Canada, the firm's practice areas include corporate, tax, entertainment, intellectual property, international, immigration and health law. Recently, the firm went through a number of acquisitions and mergers to create a national firm that is capable of a diverse portfolio of offerings. In order to manage the knowledge of a diverse and geographically dispersed group of professionals, the firm has introduced a firm-wide knowledge management strategy in order to encourage professionals to share their knowledge and collaborate. Central to this initiative is an intranet portal specifically designed for law professionals, which simplifies access to information and supports the exchange of knowledge.

## 4. Results

The 405 employees of the firm who took part in the survey offer the following profile. Most of the respondents were professional staff (23%), support staff (23%), and administrative staff (21%). In terms of tenure, about 29% had been in the firm for three years or less; 24% had been there from four to nine years; and about 26% had been in the firm for 10 years or more. About 23% were aged 26–34, another 23% were aged 35–44, and yet another 23% were aged 45–64. In terms of educational background, 34% had university degrees, and 30% had college degrees. There were more female respondents (58%), and most answered the bilingual survey in English (92%).

We report our findings according to the three domains of our analysis: information management, information behaviors and values, and information use outcomes. For each domain, we present a factor analysis of the questionnaire items, and highlight the dimensions identified by the responses. Finally, we analyze the relationships between factors in the three domains using correlation and regression analysis.

### 4.1. Information management

Table 1 shows the results of the exploratory factor analysis (principal components analysis with varimax rotation) for the information management domain. Factor loadings above 0.50, our cutoff point for including an item in a factor, are presented in bold. The results show two components with eigenvalues greater than 1.0 that accounted for 57.8% of the common variance: ‘Information management – explicit’ and ‘Information management – tacit’. Cronbach’s  $\alpha$  are 0.90 and 0.75 respectively, which are above the minimally acceptable range of 0.65–0.70 [28, p. 85]. ‘Information management – explicit’ refers to the perception that the organization has formal policies, procedures, and systems to collect information, make it accessible, and facilitate information sharing. It involves codification, documentation, and the use of information technology that are directed towards managing the more explicit dimensions of information. ‘Information management – tacit’ refers to the perception that the firm supports and encourages activities such as mentoring, apprenticeship, training and education, which tend to involve the person-to-person transfer of information or knowledge that is more tacit in nature. These two dimensions of information management are consistent with our earlier discussions of the knowledge management research that contrasts codification strategies with personalization strategies [16] and that divides the intellectual capital of a firm into structural and human capital [15].

Table 2 displays the mean scores of the items in the ‘Information management – explicit’ (IME) and ‘Information management – tacit’ (IMT) dimensions. Respondents indicated their agreement with given statements about information management in the firm, using a scale from (1) strongly disagree to (5) strongly agree. The means show that respondents agreed quite strongly with all the statements. (All items were negatively skewed, i.e. a long tail to the left; with positive kurtosis in most items, i.e. a pointed distribution.) However, the scores for IME questions were generally lower than those for IMT questions. Among the IME questions, the items with the highest means include statements that the organization has formal policies and procedures, and uses IT for managing information and knowledge. The two items with the lowest scores both concern finding needed information. Among the IMT questions, there is strong agreement that the organization encourages training, education, mentoring, and apprenticeships (all means are 4.0 or higher; negative skewness, positive kurtosis).

### 4.2. Information management – explicit

As noted earlier, in order to understand the information management approach of the firm, we interviewed the Chief Knowledge Officer and senior partners, examined the professional excellence handbook and related documents, and looked at how the corporate intranet was used. The interviews were especially useful in helping us make sense of the survey data, by providing an

Table 1  
Information management factor analysis

Factors and items	1	2
<i>Information management – explicit (<math>\alpha = 0.90</math>)</i>		
My organization has a formal policy or strategy for managing knowledge and information.	<b>0.696</b>	0.187
My organization has formal procedures to collect knowledge.	<b>0.764</b>	0.150
My organization has formal procedures to share knowledge.	<b>0.770</b>	0.221
My organization identifies and obtains knowledge from outside sources (e.g. industry partners, governments, universities).	<b>0.610</b>	0.224
Knowledge and information in my organization is available and organized to make it easy to find what I need.	<b>0.591</b>	0.479
Information about good work practices, lessons learned, and knowledgeable persons is easy to find in my organization.	<b>0.527</b>	0.468
My organization makes use of information technology to facilitate knowledge and information sharing.	<b>0.658</b>	0.395
My organization has a culture intended to promote knowledge and information sharing.	<b>0.666</b>	0.426
<i>Information management – tacit (<math>\alpha = 0.75</math>)</i>		
My work unit encourages experienced workers to communicate their knowledge to new or less experienced workers.	0.250	<b>0.699</b>
My organization encourages workers to attend training and/or education courses.	0.250	<b>0.678</b>
My organization has formal mentoring programs and/or apprenticeships.	0.262	<b>0.588</b>
My work unit has a culture intended to promote knowledge and information sharing.	0.372	<b>0.502</b>
Eigenvalues	<b>6.115</b>	1.358
Cumulative percentage of variance	<b>47.04</b>	57.48

Table 2  
Information management descriptive statistics

	N	Mean	SD
<i>Information management – explicit</i>			
My organization has a formal policy or strategy for managing knowledge and information.	377	4.19	0.952
My organization has formal procedures to collect knowledge.	347	3.72	1.058
My organization has formal procedures to share knowledge.	378	3.79	1.026
My organization identifies and obtains knowledge from outside sources (e.g. industry partners, governments, universities).	338	4.09	1.017
Knowledge and information in my organization is available and organized to make it easy to find what I need.	404	3.54	1.119
Information about good work practices, lessons learned, and knowledgeable persons is easy to find in my organization.	396	3.32	1.144
My organization makes use of information technology to facilitate knowledge and information sharing.	399	4.00	1.043
My organization has a culture intended to promote knowledge and information sharing.	393	4.11	1.029
<i>Information management – tacit</i>			
My work unit encourages experienced workers to communicate their knowledge to new or less experienced workers.	400	4.00	1.148
My organization encourages workers to attend training and/or education courses.	403	4.15	1.125
My organization has formal mentoring programs and/or apprenticeships.	385	4.12	1.115
My work unit has a culture intended to promote knowledge and information sharing.	398	4.13	1.006

understanding of the history, and business and professional context of the firm. We learned that a major impetus behind the firm's recent series of mergers is to acquire the capability to serve national clients, and to provide 'one-stop shopping' for a range of legal services. This in turn requires the firm to specialize in a number of areas, deepen individual professional expertise, and increase the value-add of their services. The effective management of information and knowledge is seen as a vital enabler of pursuing this business strategy. Thus, the firm has produced a document on knowledge management which states that it will 'make excellent KM a central part of our overall commitment to professional excellence as part of our strategy of being Canada's pre-eminent law firm.' To implement this strategy, the firm formally encourages the sharing and collection of knowledge. The appraisal of associates clearly defines two evaluation criteria as contribution to the success of others, and contribution to the firm's intellectual assets. The former requires that associates 'share knowledge and resources willingly and generously; share work and client opportunities, take initiative to contribute to the success of others', while the latter expects that they 'take time to share precedents, memos, client lists, industry contacts and new law; assist practice and professional groups in sharing knowledge; develop a particular legal or industry expertise'.

The firm has invested heavily in an intranet portal to serve as 'the foundation of our KM strategy' by 'delivering information to the right place at the right time; supporting sharing of information and knowledge; supporting communities; and providing access to applications'. The intranet was frequently used and highly regarded as the authoritative source for company policies, professional information, and people resources. It contains a database of national precedents that includes both model precedents that have been reviewed and approved by partners, and sample precedents that may be used as templates for standard legal activities. Although contribution to the precedent library is voluntary, it is a criterion for annual appraisals as noted above.

The firm adopts a multi-level governance structure to coordinate its information management efforts. This structure includes professional committees, a KM action group, a 'Knowledge Council', and an IT steering committee. A Chief Knowledge Officer was hired to provide leadership: the individual oversees the work of both library and IT professionals, and develops links with industry, the profession, government, and universities.

#### *4.3. Information management – tacit*

Entry into the legal profession requires a year as an articling 'student-at-law' before being admitted to the Bar as a professional lawyer. In addition to this standard practice, the firm has established a formal, 'compulsory' mentorship program. All lawyers who are not partners or senior counsel have a mentor. (Indeed, associates can choose their own mentors in a bottom-up process.) All senior lawyers are expected to mentor one or more junior lawyers as part of their daily activities. Thus, more experienced lawyers are expected to 'tell associates how product was used, how matter is coming along, and how it ends up ... take the time to teach; resist temptation to do everything yourself ... provide opportunities for associates to observe activity ... let associates learn by doing'. Anecdotally, some partners are viewed as being better mentors than others. However, there is little prestige accorded to good mentors, and no formal mechanism exists to sanction poor mentors or to encourage them to improve: billable hours are still the single biggest determinant of partner performance, and mentoring is a non-billable activity.

Continuous learning and education are an important part of the firm's strategy to develop, enhance and upgrade its human intellectual capital. All professionals in their first, third, and fifth year of employment attend courses that are relevant to their stage of professional growth. Thus, first-year hires attend a course that covers a 'single national checklist of topics', the third-year course focuses on 'skills development', and the fifth-year course develops 'management skills'. These courses are conducted two hours per month for eight months. Over and above these courses, all professionals in the first three years of employment attend a mandatory national training program. This program consists of one lunchtime session per month lasting one to two hours on a variety of professional topics, adding up to 45 hours. Although formal training is important, there

is a recognition that employees would ‘all have to keep learning all the time, and that this goes far beyond (though it does include) training in courses.’

There are numerous statements in the firm’s *Vision and Core Values* on how knowledge and information sharing is to be embedded in the firm’s culture. The KM document also states that

KM requires a network, but it is not a network of machines but of professionals, not a top-down system but a bottom-up culture: of sharing knowledge, not hoarding it; of teaching, not ordering; and of adding to the value of [our] knowledge bank, not just to its inventory of billable hours.

The last part of this statement alludes to the tension between billable hours and increased productivity – increased productivity from the use of knowledge would result in a smaller number of billable hours.

An important part of the KM effort is ‘making it easy for professionals to work together as a community of practitioners, rather than an aggregation of solo performers.’ Thus, the firm encourages the formation of communities of practice based on practice groups, professional groups, client service teams, and project teams.

#### 4.4. *Information behaviors and values*

Table 3 shows the results of the factor analysis (principal components analysis with varimax rotation) for the information behaviors and values domain. Factor loadings above 0.50, our cutoff point for including an item in a factor, are presented in bold. The results show seven components with eigenvalues greater than 1.0. The component with the smallest eigenvalue (1.093) was dropped because none of the factor loadings is greater than 0.30. Five of the six factors postulated by the information orientation study [19] were found and they collectively account for 60% of the common variance. These factors are: integrity, transparency, sharing, proactiveness, and informality. The factor of formality – the willingness to trust and use formal sources – was recoded as informality – the willingness to trust and use informal sources. (Items that loaded on two factors for internal and external sharing were combined into sharing, as suggested by theory.) The factor of control did not show up in this study. These factors were defined in Section 2.2 of the literature review.

Table 4 shows the mean scores of respondents who indicated their agreement with given statements about their information behaviors and values on a scale from (1) strongly disagree to (5) strongly agree. The scores indicate strong agreement with most items on sharing, proactiveness, transparency, and integrity. (Integrity items were reverse-coded, so each should be read in a sense that is the reverse of its wording.) There was strong to very strong agreement with statements relating to sharing: ‘I often exchange information with the people with whom I work regularly’ (item 8, mean = 4.49); ‘In my work unit, I am the person that people come to for information’ (item 10, mean = 3.97), and ‘I often exchange information with people outside of my regular work unit but within my organization’ (item 9, mean = 3.61). However, the situation was different when sharing with customers, clients and groups outside the firm (item 11, mean = 2.96, item 12, mean = 2.59). There was also strong agreement with statements on proactiveness, with respondents indicating that they used information to enhance their work, and that they actively sought information on external changes and responded to them (items 13–15). Mean responses for the transparency items showed strong agreement with statements that managers and supervisors encourage openness, and that information on failures or errors was acknowledged and addressed (items 5–7). On the other hand, it is interesting to note the low agreement with statements on the level of trust in and usage of informal sources in relation to formal sources (items 16–17).

#### 4.5. *Information use outcomes*

Although information use outcome questions consisted of only five items, we conducted factor analysis as part of scale development and validation. Principal component analysis extracted only

Table 3  
Information behaviors and values factor analysis

	1	2	3	4	5	6	7
<i>Integrity</i> ( $\alpha = 0.72$ ) (reverse coded)							
Employees know what to do but not the ultimate goal of their activity.	<b>0.632</b>	0.111	-0.068	0.055	0.006	-0.007	0.055
Among the people I work with regularly, it is common to distribute information to justify decisions already made.	<b>0.513</b>	-0.104	0.05	0.003	-0.005	0.125	-0.08
Among the people I work with regularly, it is normal for individuals to keep information to themselves.	<b>0.676</b>	0.449	0.163	0.099	-0.082	-0.058	-0.071
Among the people I work with regularly, it is normal to leverage information for personal advantage.	<b>0.611</b>	0.285	0.206	-0.119	-0.152	-0.148	-0.251
<i>Transparency</i> ( $\alpha = 0.80$ )							
Managers and supervisors of my work unit encourage openness.	0.284	<b>0.487</b>	0.339	0.064	0.051	0.134	0.173
The people I work with regularly share information on errors or failures openly.	0.194	<b>0.782</b>	0.095	0.036	-0.042	-0.042	0.025
The people I work with regularly use information on failures or errors to address problems constructively.	0.179	<b>0.828</b>	0.140	0.053	0.011	0.096	0.057
<i>Sharing – internal</i> ( $\alpha = 0.66$ )							
I often exchange information with the people with whom I work regularly.	0.161	0.245	<b>0.620</b>	0.167	0.071	0.146	-0.107
I often exchange information with people outside of my regular work unit but within my organization.	0.164	-0.093	<b>0.550</b>	0.134	-0.037	0.346	0.148
In my work unit, I am a person that people come to often for information.	-0.002	0.049	<b>0.562</b>	0.074	0.047	0.129	0.014
<i>Proactiveness</i> ( $\alpha = 0.78$ )							
I actively seek out relevant information on changes and trends going on outside my organization.	-0.006	0.033	0.333	<b>0.686</b>	0.057	0.144	0.082
I use information to respond to changes and developments going on outside my organization.	0.093	0.049	0.193	<b>0.957</b>	0.023	0.183	-0.045
I use information to create or enhance my organization's products, services, and processes.	0.023	0.156	0.440	<b>0.378</b>	0.063	0.214	-0.05
<i>Informality</i> ( $\alpha = 0.67$ )							
I trust informal information sources (e.g. colleagues) more than I trust formal sources (e.g. memos, reports).	-0.109	-0.021	0.022	-0.037	<b>0.617</b>	0.017	0.035
I use informal information sources (e.g. colleagues) extensively even though formal sources (e.g. memos, reports) exist and are credible.	0.041	0.001	-0.036	0.049	<b>0.854</b>	-0.009	0.074
I use informal information sources (e.g. colleagues) to verify and improve the quality of formal information sources (e.g. memos, reports).	-0.011	0.066	0.152	0.091	<b>0.528</b>	0.093	-0.134
<i>Sharing – external</i> ( $\alpha = 0.76$ ); <i>Sharing – internal and external</i> ( $\alpha = 0.74$ )							
I often exchange information with citizens, customers, or clients outside my organization.	0.059	0.008	0.157	0.213	0.070	<b>0.705</b>	-0.063
I often exchange information with partner organizations.	0.062	0.083	0.206	0.089	0.049	<b>0.763</b>	0.058
Eigenvalues	5.058	2.880	1.830	1.645	1.263	1.137	1.093
Cumulative percentage of variance	21.99	34.51	42.47	49.62	55.11	60.06	64.81

Table 4  
Information behaviors and values descriptive statistics

		N	Mean	SD
<i>Integrity (reverse-coded)</i>				
1	Employees know what to do but not the ultimate goal of their activity.	368	3.12	1.260
2	Among the people I work with regularly, it is common to distribute information to justify decisions already made.	325	3.13	1.204
3	Among the people I work with regularly, it is normal for individuals to keep information to themselves.	357	3.29	1.347
4	Among the people I work with regularly, it is normal to leverage information for personal advantage.	337	3.77	1.284
<i>Transparency</i>				
5	Managers and supervisors of my work unit encourage openness.	376	3.82	1.161
6	The people I work with regularly share information on errors or failures openly.	376	3.30	1.210
7	The people I work with regularly use information on failures or errors to address problems constructively.	361	3.50	1.160
<i>Sharing</i>				
8	I often exchange information with the people with whom I work regularly.	383	4.49	.837
9	I often exchange information with people outside of my regular work unit but within my organization.	383	3.61	1.210
10	In my work unit, I am a person that people come to often for information.	383	3.97	1.020
11	I often exchange information with citizens, customers, or clients outside my organization.	381	2.96	1.301
12	I often exchange information with partner organizations.	353	2.59	1.254
<i>Proactiveness</i>				
13	I actively seek out relevant information on changes and trends going on outside my organization.	358	3.51	1.134
14	I use information to respond to changes and developments going on outside my organization.	352	3.54	1.034
15	I use information to create or enhance my organization's products, services, and processes.	355	3.98	1.005
<i>Informality</i>				
16	I trust informal information sources (e.g. colleagues) more than I trust formal sources (e.g. memos, reports).	360	2.68	1.070
17	I use informal information sources (e.g. colleagues) extensively even though formal sources (e.g. memos, reports) exist and are credible.	361	2.95	1.173
18	I use informal information sources (e.g. colleagues) to verify and improve the quality of formal information sources (e.g. memos, reports).	365	3.58	1.073
<i>Control</i>				
19	I receive information about the performance of my organization.	368	3.30	1.251
20	My knowledge of organizational performance influences my work.	373	3.43	1.206
21	In my organization, information is essential to organizational performance.	376	4.38	.849
22	Information in my organization is distributed on a 'need to know' basis.	364	2.51	1.132
23	Employees know what to do but not the ultimate goal of their activity.	368	3.12	1.260

Table 5  
Information use outcomes factor analysis

Items	
I can quickly recognize the complexities in a situation and find a way of solving problems.	Principal component analysis extracts only one component with eigenvalue > 1.0 (eigenvalue = 2.256; 45.12% of common variance)
My work tasks demand new, creative ideas and solutions.	
My work benefits my organization.	
I have influence over what happens within my work unit.	
Sharing information is critical to my being able to do my job.	
$\alpha = 0.67$ (information use outcomes)	

Table 6  
Information use outcomes descriptive statistics

	<i>N</i>	Mean	SD
I can quickly recognize the complexities in a situation and find a way of solving problems.	357	4.22	0.715
My work tasks demand new, creative ideas and solutions.	358	3.84	1.001
My work benefits my organization.	353	4.49	0.679
I have influence over what happens within my work unit.	352	3.39	1.227
Sharing information is critical to my being able to do my job.	358	4.39	0.829

one factor with eigenvalue >1.0, and this factor accounted for 45.1% of the common variance between items, with  $\alpha = 0.67$  (Table 5).

Table 6 shows the mean scores of respondents who indicated their agreement with given statements about information use outcomes on a scale from (1) strongly disagree to (5) strongly agree. The scores indicate very strong agreement (means > 4.0) with the three statements on being able to solve problems (task performance), the work benefiting the organization (self-efficacy), and sharing information (social maintenance). (All items were negatively skewed, i.e. a long tail to the left; with positive kurtosis in most items, i.e. a pointed distribution.)

#### 4.6. Multivariate analysis

To create an aggregate score for information use outcome, item scores pertaining to the information use factor (Table 6) were summed. To create aggregate scores for each of the five information behaviors and values (integrity, transparency, sharing, proactiveness, informality), item scores pertaining to each factor were summed. Similarly, aggregate scores for IME and IMT were formed by adding their respective item scores.

As indicated in the conceptual framework (Figure 1), we look for relationships between the variables of information management, information culture (information behavior and values), and information use outcomes. Table 7 shows the correlations between these variables. Information use outcome is significantly correlated with each of the five information behaviors and values. All correlations are in the expected direction (positive), with sharing and proactiveness showing moderately strong correlations with information use outcome. IME and IMT are both positively but weakly correlated with information use outcome.

Table 7  
Correlations between information use, information behaviors and values, and IM variables

	Use outcome	Sharing	Transparency	Proactiveness	Informality	Integrity	IM_tacit	IM_explicit
Use outcome	1	0.471**	0.292**	0.463**	0.157**	0.194**	0.351**	0.226**
Sharing	0.471**	1	0.271**	0.483**	0.176**	0.136*	0.355**	0.204**
Transparency	0.292**	0.271**	1	0.157**	0.064	0.407**	0.538**	0.401**
Proactiveness	0.463**	0.483**	0.157**	1	0.124*	0.066	0.314**	0.088
Informality	0.157**	0.176**	0.064	0.124*	1	-0.125*	0.058	-0.101
Integrity	0.194**	0.136*	0.407**	0.066	-0.125*	1	0.375**	0.346**
IM_tacit	0.351**	0.355**	0.538**	0.314**	0.058	0.375**	1	0.670**
IM_explicit	0.226**	0.204**	0.401**	0.088	-0.101	0.346**	0.670**	1

\*\*Correlation is significant at the 0.01 level (two-tailed). \*Correlation is significant at the 0.05 level (two-tailed).

Table 8  
Information use regression model 1

Dependent variable	Independent variables	<i>Std</i> $\beta$	Significance	Model Adj. $R^2$	$F$	Significance
Information use outcome	Sharing	0.312	0.000	0.378	32.129	0.000
	Transparency	0.130	0.023			
	Proactiveness	0.311	0.000			
	Informality	0.124	0.014			
	Integrity	0.040	0.472			

Table 9  
Information use regression model 2

Dependent variable	Independent variables	<i>Std</i> $\beta$	Significance	Model Adj. $R^2$	$F$	Significance
Information use outcome	Sharing	0.357	0.000	0.386	19.792	0.000
	Transparency	0.147	0.032			
	Proactiveness	0.208	0.002			
	Informality	0.115	0.042			
	Integrity	-0.030	0.651			
	IM_tacit	0.118	0.146			
	IM_explicit	0.024	0.735			

In order to examine the effect of each variable while controlling for the effect of the others, multiple regression of information use outcome on the five information behaviors and values was performed. Table 8 shows the results. The model's adjusted  $R^2$  is 0.38, and the  $F$  value for the model  $R^2$  is significant at  $< 0.01$ . The standardized regression coefficients of sharing, transparency, proactiveness, and informality are significant at  $< 0.05$ . The coefficients of sharing and proactiveness are the largest ( $std \beta = 0.31$ ,  $< 0.01$  for both). Table 9 shows a separate multiple regression that includes IME and IMT: the  $std \beta$  of neither of these variables is statistically significant.

#### 4.7. Summary of results

We may summarize the results of the study in terms of information use, information culture, and information management as follows. Employees of the firm believe that they can use information effectively to solve work problems, that their work benefits the organization, and that information sharing is critical to their being able to do their job. These perceptions are rooted in an information culture of strongly held values relating to the sharing, proactiveness, transparency, and informality of information (Table 4). These four information values together account for a significant proportion (38%) of the variance in information use outcomes (Table 8). Sharing and proactiveness have the largest effect on information use outcomes. Thus, employees indicate that they often exchange information with the people they work with regularly, and that they are proactive in seeking and using information on external change and on ways to improve services and processes.

Employees perceive the organization as pursuing information management that is directed at both the explicit dimensions (formal policies, procedures and systems) and tacit elements (training, mentoring, and the transfer of expertise) (Table 1). Both forms of information management are significantly correlated with information use outcomes, although the coefficients are small (0.23 and 0.35 respectively, Table 7). However, when included in a regression model on information use outcomes, the coefficients of either form of information management are not statistically significant (Table 9).

## 5. Discussion and conclusion

This study examined the information use environment of a large professional services organization. We analyzed information use outcomes as a function of information culture and information management. Looking at information culture, our study found that perceptions of information use outcomes are correlated significantly with perceptions of information values relating to sharing, proactiveness, transparency, and informality. Results suggest that the firm's information culture is characterized by a high degree of internal information sharing, and a strong sense of actively using information to develop products and services. These findings are consistent with the view of a law firm as an information- and knowledge-intensive organization that works with information to create knowledge which is delivered to clients in the form of counsel or advice.

At the same time, the information values of the firm appeared to be tempered by the requirement to use information in the service of clients. Thus, *integrity* was not statistically significant in explaining information use outcome in the regression analysis (Table 8). Marchand et al. [19] define integrity as the principled and trustful way of sharing and using information. We hypothesize that the effect of integrity in this study may have been influenced by the business of organization, the way it works with information, and the norms and practices of the profession. Thus, the client-centered relationship of the organization, the instrumental use of information to advocate the positions of clients, and the need to treat client information with confidentiality, may have confounded the effect of the integrity factor. Moreover, respondents may not answer candidly questions such as 'Among the people I work with regularly, it is common to distribute information to justify decisions already made', and 'Among the people I work with regularly, it is normal to leverage information for personal advantage'. In the earlier study by Marchand et al., these questions were presented to senior managers to identify important concepts in their thinking about information behaviors and values. The present study asked respondents to report based on information practices in their workplace: it is conceivable that respondents may have been uncomfortable with providing frank responses to these questions.

Whereas the influence of information culture on information use outcomes appears to be significant, the effects of information management are less clear in this study. We used the work of Taylor [9], Davenport [11], Roos et al. [15], and Choo and Bontis [14] to develop 12 questions covering the range of information management approaches that organizations typically adopt. As discussed in the literature review section, Taylor's 'information use environment' construct [5, 9] focuses on how information use is shaped by the characteristics of sets of people in contexts that include culture, style, history, and experience. The present study found such a relationship between information culture and information use. Two important elements of Davenport's information ecology framework [11] are information behaviors, which are concerned with how people share information; and information processes, which describe how people use information to do their work. This study identified the norm of information sharing as having a significant effect on information use outcomes. The knowledge management literature [14, 15] often distinguishes between tacit and explicit forms of knowledge. This study extends that discussion when it finds that participants perceive information management in a similar way. In the firm we studied, employees perceive information management as focusing on two areas: information management activities that develop policies and procedures to codify explicit knowledge (IME); and information management activities that focus on the person-to-person sharing or transfer of tacit knowledge (IMT). The survey results indicate

that employees generally perceive a high degree of information management activity in both areas, with stronger agreement reported in the area of 'information management – tacit.' Thus, there was strong agreement with statements that the organization encourages training, education, mentoring, and apprenticeships. There was also a clear perception that the firm has formal policies and procedures for managing information and knowledge, and uses IT to facilitate information sharing.

Correlation analysis showed that both IME and IMT were correlated with information use outcomes, but in the multiple regression model, their coefficients were not statistically significant (Table 9). In other words, the inclusion of IME and IMT did not contribute significantly to the model's ability to explain the variance in information use outcomes. We hypothesize three reasons for this result. First, the information management initiatives are relatively recent and more time is needed for their effects to be felt. Second, the information management initiatives may have an indirect effect on information use outcomes, perhaps acting through the information behaviors and values of the firm. Third, information management practices involving the search and use of explicit or codified knowledge may have become routinized and taken for granted over the years. A future paper would consider these possibilities.

It is important to recognize the limitations of the present research. We studied only one firm, and it is not clear to what extent the findings may be generalized. Two factors specific to the firm may be worth noting when considering its information management activities. First, the company is one of the first law firms in Canada to embark on an ambitious information and knowledge management strategy that includes 'best practices' such as mentoring, training, codes of excellence, communities of practice, and an intranet portal. Second, more than one quarter of the survey participants had been in the firm for 10 years and more; another quarter had been there from four to nine years. Generally, norms of professional practice and business operation are well developed and typical of a law firm offering a similar range of services. One reason for studying the firm was this combination of an innovative push towards strategic information management and an established information culture based on professional norms and values. While generalization to other organizations may not be possible, it is worth noting that over 400 employees of the firm took part in the survey, lending confidence to the results of the data analysis. Since this first study, we have replicated the survey in two other organizations (an engineering firm, and a public sector agency) and initial analysis indicates a similar pattern of results. Another limitation is that the survey asked employees to report their perceptions of information behaviors and practices. Reported perceptions may not be the same as actual behaviors. Nevertheless, the pattern of survey responses appeared to be consistent with the data from interviews, site visits, and answers to open-ended questions.

In terms of contribution to theory, this study reinforces the work of Taylor [5, 9] and Davenport [11] that highlights the importance of the informational aspects of organizational culture in influencing information use and behaviors. While organizational culture affects behavior in general, we suggest that a part of culture that deals specifically with attitudes about information – the perceptions, values, and norms that people have about creating, owning, sharing, applying information – exercises a significant effect on information use outcomes. This concept of 'information culture' is largely missing from current research. Moreover, this study suggests that the information orientation framework developed by Marchand et al. [19], especially the information behaviors and values component of the framework, may be a useful way to begin a more systematic examination of information culture.

In terms of specific results, our study looked at a professional services firm whose members report information values of sharing, proactiveness, transparency and informality. At the time of the study, the firm was also pursuing an information and knowledge management strategy to improve its ability to share and access information, and to broaden and deepen the expertise of its staff. Our study suggests that, at least for this organization, information culture has a greater impact than information management on information use outcomes. Thus, the strongly held information values and behaviors of sharing, proactiveness, transparency and informality together accounted for more than one-third of the variance in information use outcomes in the study firm. Although employees perceive a high level of information management activity in the organization, this activity did not, at the time of the study, help to explain the variance in information use outcomes. What can organizations do to improve

information use outcomes? This study suggests that organizations might do well to remember that in the rush to implement strategies and systems, information values and information culture will always have a defining influence on how people share and use information.

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