Adopting an ICT code of conduct:

An empirical study of organizational factors

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Research paper

Purpose

Following the example of Anglo-Saxon companies, French companies are increasingly establishing codes of conduct specific to the use of Information and Communication Technologies (ICT). A review of literature reveals that such codes have multiple goals, such as improving efficiency of use, IS security awareness, and ethics. This paper aims to identify organizational factors influencing the adoption and diffusion of a formal code of conduct.

Design / methodology / approach

A survey was administered to 505 companies. In order to highlight the emerging nature of this practice, the study was conducted in similar conditions for two consecutive years (2002 and 2003).

Findings

Results indicate that though still marginal, the adoption of ICT codes of conduct concerns an increasing number of companies. This practice is related to the degree of standardization, technological context (the degree of virtualization and the strategic importance placed on ICT by the management) and size of the organization. However, the adoption of ICT codes of conduct is not associated with specific industry sectors and nationalities.

Research limitations

The study was conducted in France and a generalization of the results to other countries may be questionable.

Originality / value

The paper deals with a topic which has received little attention to date. The contribution of this paper is two-fold: (1) a previously unperformed review of research involving ICT codes of conduct, and (2) empirical results describing the organizational factors of an ICT code of conduct diffusion. It allows a better understanding of this emerging IS management practice.

Keywords: ICT use; appropriation; regulation; code of conduct.

INTRODUCTION

Both academics and practitioners recognize that the potential of IT depends on how it is used (DeSanctis et Poole, 1994; Orlikowski, 1992; 1994). Orlikowski and Hofman (1997), drawing on the work of Argyris and Schön (1978), distinguish "espoused technology" from "technology-in-use": there is often a discrepancy between how designers and decision-makers think about normal and effective use of technology and how employees actually use it. This gap results from the equivocal nature of information and communication technologies (Weick, 1990). When "technology stakeholders" – i.e. users, technicians, decision-makers – have different understanding and assumptions about the nature of technology, its goal, and the way it should be used, the interpretive flexibility of the technology can be a source of organizational problems or conflicts (Orlikowski and Gash, 1994). These problems can be related to security, ethics, or individual and organizational inefficiency. How then can managers encourage employees to use ICT according to organizational goals?

In the literature, two main types of regulatory actions can be identified (de Vaujany 2000). On the one hand, there are methods which technically restrict the possibilities of use. On the other hand, there are actions that facilitate or orient the appropriation process and the development of employee's perceptions of appropriate ICT usage. This second category includes some managerial actions such as training, awareness campaigns, user interface design, technology-use mediation, or formalization and diffusion of a code of conduct among employees. While much research deals with user training or interface design, the question of ICT codes of conduct has received much less attention to date. Nevertheless, several studies show that a growing number of organizations are introducing ICT codes of conduct (Cigref, 1999, 2000; Healy and Iles, 2002; Bouchet et al., 2002; Isaac, 2003). Our paper therefore seeks to explore this issue. It aims to investigate the influences on organizations' adoption of ICT codes of practice. Although we recognize that institutional factors can affect the adoption of such codes (DiMaggio and Powell, 1983; Ramiller and Swanson, 1997), this study will focus on

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organizational factors. The influence of structural, technological, cultural, and demographic factors will be examined.

This paper begins by reviewing previous research on ICT codes of conduct. It goes on to propose several assumptions about organizational factors that influence their adoption. After explaining the research methodology, results are presented and discussed.

ROLE AND IMPACT OF CODES ON USER BEHAVIOR

Regulating the use of ICT

A literature review reveals that adopting a code of conduct specific to the use of ICT can meet several concerns of managers:

- Improving efficacy and appropriate use (Tyre and Orlikowski, 1994; Romm and Pliskin, 1998; de Vaujany, 2000). For example, a French automobile firm has issued guidelines for the use of e-mail containing recommendations such as: "Be sure that e-mail is the most suitable medium of communication", "Write concise and precise messages", etc. (Cigref, 2000);

- Deterring illegal behavior and abuse such as software piracy, and heightening user awareness of computer security issues (Straub and Nance, 1990; Cigref, 2002; Mirchandani and Motwani, 2003);

- Formalizing "bilateral" ethical guidelines related to the use of ICT, and more specifically to issues such as electronic monitoring, use of resources for personal purposes, and privacy. In this case, the code institutes a sort of moral contract between employees and employer (Bouchet et al, 1999; Mercier and Coulon, 2002; Isaac, 2003).

A code therefore clarifies the rights, duties and responsibilities of technology stakeholders and specifies the scope of an acceptable and efficient use of ICT.

By specifying that a monitoring and disciplinary system exists if users fail to comply with the rules, a code can help to deter abuse (Straub and Nance, 1990; Mirchandani and Motwani, 2003).

In addition, formalizing a code of conduct can be a means of coping with an ambiguous legal environment (Isaac and Kalika, 2001; Mercier and Coulon, 2002). Attached to employment contracts or rules of procedure, it constitutes an effective legal safety net.

Empirical studies of the content of ICT codes of conduct highlight great diversity in both form and spirit. Content differs according to the type of organization (e.g. businesses, government and non-profit organizations, academic institutions) and the department initiating creation of the code (IS department, head office, HR department, legal department) (Whitman et al., 1999; Healy and Iles, 2002). Moreover, Pierce and Henry (1996) have noted that the degree of guidance varies from very specific to vague references to the use or abuse of technologies. Codes mostly deal with security and efficiency issues. Ethical concerns, such as respect of employees' privacy, are rarely addressed (Healy and Iles, 2002). Finally, the technologies to which the codes are applied vary. In some cases, they deal exclusively with Internet technologies such as e-mail, the World Wide Web and Intranets (Benkirane et al., 2003). In others, they aim to control the use of all computer and telecommunication tools (e.g. hardware, software, files, data and communication media).

Acceptance of the code and its influence on user behavior

While employees perceive clarification of what constitutes acceptable use of technologies as useful and legitimate (Lim et al., 2002), restrictive policies do not seem to be well-accepted (Rodhain and Agarwal, 2001). In order to preserve their feeling of autonomy, users prefer their employer to issue general guidelines rather than formal rules of use. Users also accept rules better when they are negotiated and introduced in a consensual way than when they are imposed from above. In their exploratory study, Hacker et al. (1998) show that frequent and experienced users are generally more opposed to the institution of rules of use than others.

A code of conduct allows employees to better evaluate what the organization deems acceptable or not (Hacker et al. 1998; Pierce and Henry, 2000). However, previous research shows that its influence on

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individual judgment and behavior is limited (Harrington, 1996; Pierce and Henry, 1996, 2000; Rodhain and Agarwal, 2001; Healy and Iles, 2002). In addition, IS professionals believe that codes are not a very effective deterrent against abuse (Loch et al., 1998; Mirchandani and Motwani, 2003). Although introducing codes seems to have a limited impact on individual behavior, a growing number of organizations are doing so. In order to explore this trend, we propose to identify the organizational factors influencing the implementation of a code of conduct.

ORGANIZATIONAL FACTORS OF THE DIFFUSION OF A CODE

Several organizational factors can explain what differentiates organizations in their desire to control ICT use. The identified factors relate to the organization's structure, technological context, cultural and, demographical characteristics.

A structural factor: the extent of standardization

The extent of standardization corresponds to the importance of rules and formal procedures in the organization (Lawrence and Lorsch, 1986). The purpose of standardization is to guarantee a certain stability and predictability of behavior (Jackson and Adams, 1979).

Creating and implementing a code of conduct specific to the use of ICT can be regarded as a means of standardization (Mintzberg, 1982, Kalika, 1988). A code lays down formal guidelines and conditions for using technologies. By restricting freedom in the way ICTs are used, managers seek to control and stabilize the way users behave (Cigref, 1999). Therefore, we propose that the desire to control ICT use by means of a code of conduct is more widespread in highly standardized organizations.

H1: The diffusion of an ICT code of conduct is positively related to the degree of standardization of the organization.

Factors related to the technological context of the organization

Benkirane et al. (2003) have pointed out that the decision to formalize a policy of acceptable use is not related to how long a company has been using the technologies. Generally, it occurs when the organization has experienced problems, conflict, damage, or loss because of improper ICT use. Two other components of a company's technological context can also be related to the diffusion of a code: the degree of the firm's virtualization and the strategic importance placed on ICT by management.

The firm's degree of virtualization

Virtualization refers to the transformation through computer or telecommunication tools of physical activities or activities using a physical support into immaterial activities (Isaac, 2002, 2003). Three levels of virtualization can be identified: (1) traditional firms, in which information systems are underdeveloped and the virtualization of managerial, operational and decisional processes is practically non-existent; (2) companies that focus on only one aspect of virtualization, such as optimizing business processes, customer relationship management or knowledge management, (3) virtual companies that are technologically well-equipped and have virtualized all of their processes.

More relevant than the mere level of equipment, the degree of virtualization is an indicator of the extent to which ICTs are integrated into employees' daily tasks. We propose that the need to control ICT use increases as the employees' working environment becomes more virtual.

H2a: The diffusion of an ICT code of conduct is positively associated with the degree of virtualization of the end-users' working environment.

Strategic importance placed on ICT by management

Although there is still a debate on the ability of information technologies to provide a competitive advantage, there is no doubt that IT can potentially improve an organization's performance (Porter and Millar 1985; Bakos, 1986; Mata, Fuerst and Barney, 1995; Henderson and Venkatraman, 1999). Nevertheless, according to the resource-based theory, IT can add value to a firm only if the organization is able to conceive, implement, and exploit it in an efficient way (Barney, 1991).

We propose that the greater the strategic importance placed on ICT by the organization, the more the organization will tend to take managerial actions aiming to improve ICT use benefits, such as formalization and diffusing an ICT code of conduct.

H2b: The diffusion of an ICT code of conduct is positively related to the strategic importance placed on ICT by the firm.

A cultural factor: the nationality of the parent company

We assume that the diffusion of an ICT code of conduct is likely to be related to the parent company's nationality for several reasons.

First, the level of ICT equipment varies from one country to another because of differences in economic development and culture (Hofstede, 2001). Thus, we can expect ICT codes of conduct to be more widespread in companies from countries, such as the United States, that adopted ICTs early and profit from a more important experience feedback in the ICT use.

Second, individuals from different countries do not have the same cultural attitude towards rules. The institution of organizational rules is more or less widespread, and is adapted according to the cultural characteristics of the country (Hofstede, 1980; D' Iribarne, 1989; Rodrigues and Kaplan, 1998).

Third, differences in the legal environment can make self-regulation by internal rules more or less necessary.

Thus, we suppose that the diffusion of an ICT code of conduct is a more or less widespread according to the form's country of origin.

H3: The diffusion of an ICT code of conduct is related to the parent company's nationality.

Demographic factors

The organization's size and industry sector are two of the demographic characteristics that may be related to the diffusion of an ICT code of conduct.

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Size (workforce)

According to Hall et al. (1967) the link between the number of written rules and policies and an organization's size is tenuous. In addition, Benkirane et al. (2003) show that the size of the firm does not seem to significantly influence the adoption of an Acceptable Internet Use Policy (AIUP).

Nevertheless, it appears that improper uses of technologies and information systems are proportionately more frequent in large organizations than in small ones (Hoffer and Straub, 1989). In addition, it appears that large organizations implement more counter-measures intended to deter abuse (Kankanhalli et al., 2003). Healy and Iles (2002) showed that in the UK, ethical codes related to the use of ICT are more widespread in large companies. Moreover, Kalika (1988) demonstrated the link between size of the firm and standardisation. Consequently, we propose that:

H4a: The diffusion of an ICT code of conduct is positively related to the organization's size.

Industry sector

First, the degree of equipment and of ICT use varies from one industry to another (Kalika et al. 2003). Moreover, it has been shown that some sectors, such as finance, are more exposed to the risk of abuse than others because of the strategic and sensitive nature of information (Hoffer, Straub, 1989; Straub and Nance, 1990; Kankanhalli et al., 2003). Consequently, we assume that the need to control ICT use varies from one sector to another.

H4b: The diffusion of an ICT code of conduct is related to the organization's industry sector.

The research model is shown below in schematic form.

------------- Take in figure 1 -------------

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METHODOLOGY

The data were collected in the framework of a broader study on use of ICT and their impacts on organizations. It was conducted in France by the Dauphine-Cegos E-management Observatory[1]. Founded in 2001, this research center conducts surveys on IT and management every year. The sample is extracted from a data base of French compagnies. It is built on the following two crireria: size and industry type. A telephone survey[2] was administered to a sample of 505 companies in 2002 and 503 companies in 2003. The sample for 2002 and 2003 consisted of different companies, but the structure of the sample in terms of size and industry sectors repartition is similar.

One of the top-level managers was surveyed in each organization. The respondents were primarily chief executives (19 percent), general managers (11 percent) or IS managers (45 percent). The survey questions were previously tested in order to ensure that respondents, despite of their position, would be able to answer all questions. Moreover, we checked that the number of respondents declaring that his/her firm had a formalized did not vary significantly according to his/her position[3]. Only companies with a workforce of more than 50 were taken into account. The majority of surveyed firms (75 percent) were medium-sized (i.e., having a workforce of less than 500). All sectors were represented, with a significant number of companies from manufacturing industry. In 2003, 33 percent of the surveyed companies said they had circulated an ICT code of conduct to their employees, compared with 25 percent in 2002. This result shows that, though still marginal, the practice is emerging in an increasing and significant way in France.

The operationalization of constructs is presented in the appendix.

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[1] www.observatoireemanagement.com
[2] The survey was conducted by Ipsos, a firm specialized in telephone surveys (www.ipsos.com)
[3] Chi-square = 9,620 ddl=12 , p=,649.

RESULTS

Test of hypotheses

To test the assumptions relating to the organizational factors contingent to the diffusion of a code, independence tests were carried out (Pearson Chi-Square). Organizations weren't taken into account in the analysis when data missed or when respondents chose the "I don't know" item.

--------------- Take in Table I---------------

The diffusion of an ICT code of conduct is positively related to the firm's degree of standardization. Codes are clearly more widespread in highly standardized organizations. Thus, H1 is validated.

This practice is also associated with the firm's degree of virtualization. We notice that it mainly concerns virtual companies and, to a lesser extent, partially virtualized companies. For instance, in 2003, only 12.3 percent of traditional companies said they had a formal ICT code of conduct whereas 49,3 percent of virtual companies reported to have one. Thus, H2a is supported.

Moreover, the assumption (H2b) that the diffusion of an ICT code of conduct is related to the strategic importance placed on the technologies by top management is validated. In fact, the proportion of companies having adopted a code increases with the strategic importance placed on ICT.

In 2002, we note a significant relationship between the adoption of an ICT code of conduct and the nationality of the parent company. This practice was more developed in American companies than in French companies or European companies in general. However, there was no longer any significant difference in 2003. Thus, H3 is partially validated.

Concerning the demographic factors, we support that the diffusion of an ICT code of conduct is closely related to the company's size. The larger the company, the more marked the trend to adopt a code of conduct. A threshold effect can be seen beyond 5,000 employees: the vast majority of companies with more than 5000 employees have adopted codes, but only a minority of smaller

companies. The threshold effect was less strong in 2003, since a growing number of smaller organizations are adopting codes. Therefore, H4a is validated.

Finally, in 2002, the diffusion of an ICT code of conduct was a practice unequally widespread from one sector to another. In the financial sector, one company out of two said they had diffused such a code. This result could be explained by the highly confidential and sensitive nature of information and thus the more significant risk of abuse (Straub and Nance, 1990; Kankanhalli et al., 2003). The diffusion of codes also seemed widespread in the telecommunications sector (41.9 percent). A partial explanation lies in the fact that this sector has greater experience in the use of ICT. Nevertheless, no significant difference exists in 2003. Companies from all sectors had introduced ICT codes of conduct. Thus, H4b is partially validated.

Discussion

--------------- Take in Table II--------------

This study of ICT codes of conduct reveals the emerging and current nature of the practice in France. In 2003, 33 percent of companies in the survey said they had diffused a code, compared with 25 percent in 2002.

As expected, the results confirm that the desire to control ICT use by a code of conduct is influenced simultaneously by structural, technological, cultural, and demographic factors.

First, an ICT code of conduct, like any code of conduct, is a means for standardizing use: managers seek to control and stabilize user behavior. It is therefore not surprising to encounter this practice more frequently among highly standardized companies.

Second, the existence of an ICT code of conduct is closely related to the company's technological context. On the one hand, it mainly concerns companies that have reached a certain degree of virtualization. In other words, as an organization's processes become more virtual so does its

employees' working environment, and with it the organization's need to control ICT use. On the other hand, companies that place great strategic importance on ICT are more likely to implement a code of conduct. Thus, in accordance with the assumption whereby only an efficient and proper use of technology enables the creation of value, companies hoping to obtain a competitive advantage from ICT seem more concerned with the issue of regulating use as reflected by a higher percentage of implemented codes of conduct.

Concerning cultural context, operationalized by the parent company's nationality, the empirical results reveal that this practice was "borrowed" from American companies. In 2002, it was mostly American companies that had implemented codes of conduct. In 2003, companies of all nationalities had adopted them. This difference between American and European companies can be explained by a different pace in the adoption of technologies (Hofstede, 2001): American firms adopted ICT sooner and benefited from an experience feedback before European companies. Considering the uncertainty generated by the appropriation of information technologies and the ambiguity of the legal environment on that issue, we assume that European companies imitated the practices previously developed by American companies (DiMaggio and Powell, 1983). The same phenomenon was observed in the development of ethical codes in European companies (Langlois and Schlegelmilch, 1990).

Furthermore, although the trend decreases in 2003, the results confirm that ICT codes of conduct are mainly adopted by large companies. More specifically, over 70 percent of companies with a workforce of more than 5,000 implemented a code to their employees. This result supports those obtained by Healy and Iles (2002).

Finally, in 2002 this practice seemed to be limited to certain specific sectors, such as the financial sector and telecommunications services. By 2003, in contrast, there no longer seems to be any significant difference from one sector to another. A phenomenon of imitation seems to have been at work.

Thus, codes are gradually being adopted by companies of all sizes, from all sectors and countries.

CONCLUSION

Previously, most research on ICT use focused on the adoption and integration of ICT in organizations and in working methods. The issue of the relevance of the uses developed during the appropriation phase has received much less attention (de Vaujany, 2000). However the quality, efficiency, security, and even sometimes legality of ICT use are real concerns for practitioners, as can be seen from the growing number of companies formalizing rules of use.

This study of ICT codes of conduct shows that this practice, although still marginal, is increasingly widespread in France. It also shows that the regulation of ICT use by a code of conduct is not an issue that concerns all companies uniformly. The choice mainly depends on the company's degree of standardization, its technological context, and its size. However, whereas industry sector and parent company nationality were useful indicators of the diffusion of codes in 2002, the practice now appears prevalent in all firms, indiscriminate of country and sector.

This study's strengths include the sample size (over 500 companies) and its longitudinal nature, which highlights the diffusion of this practice in France and makes the results more reliable. To the best of our knowledge, it is also the first empirical study of the subject in France.

Nevertheless, several limitations should be noted. First, other factors can affect the decision to control ICT use. It can also be influenced by organizational culture or experiences in ICT use, good or bad. Second, the composition of the sample means that the results should not lightly be generalized to other countries (the study was carried out in France). Third, in view of the complexity of the phenomenon, it would be helpful to supplement the results of this study with a more qualitative approach. Further research is needed into the adoption and implementation of codes, their acceptance by users and their effectiveness. Finally, the diffusion of a code can be accompanied by other types of regulatory measures such as awareness campaigns, training, mediation or adaptation of interfaces. These elements should also be taken into account in the analysis of the phenomenon.

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--------------Take in Appendix--------------

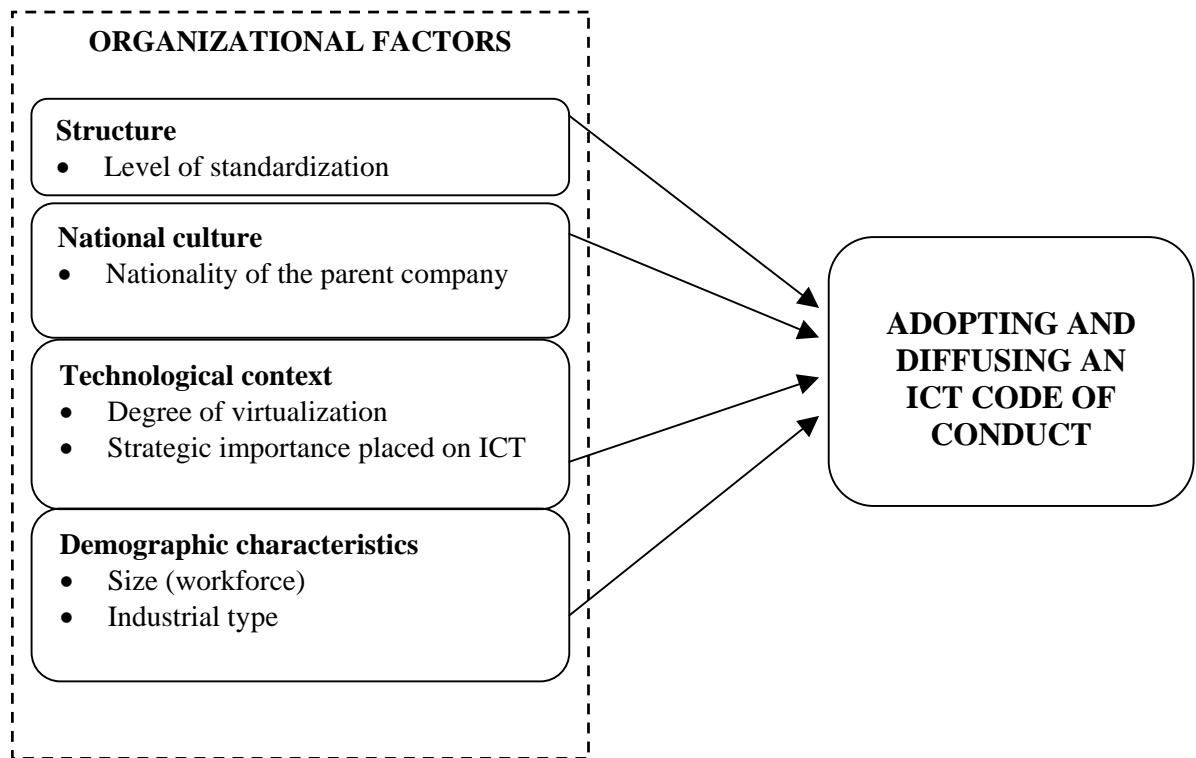*Figure 1. Organizational factors related to the diffusion of an ICT code of conduct*

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Table I. Cross-tabulations

FACTORS		2002					2003				
		Surveyed companies			χ² test		Surveyed companies			χ² test	
		Code	No code	Total	p-value	Sig.	Code	No code	Total	p-value	Sig.
Degree of standardization											
Weak	Raw	27	124	151	19,485	.000	31	94	125	11.166	.004
	%	17.9	82.1	100			24.8	75.2	100		
Moderate	Raw	30	119	149	df = 2		56	125	181	df = 2	
	%	20.1	79.9	100			30.9	69.1	100		
Strong	Raw	70	120	190			79	108	187		
	%	36.8	63.2	100			42.2	57.8	100		
Degree of virtualization											
Weak (traditional companies)	Raw	16	103	119	23.129	.000	14	88	102	26.646	.000
	%	13.4	86.6	100			12.3	87.7	100		
Partial	Raw	43	138	181	df = 2		71	120	191	df=2	
	%	23.8	76.2	100			28.7	71.3	100		
Total (virtual companies)	Raw	35	46	81			17	92	109		
	%	43.2	56.8	100			49.3	50.7	100		
Strategic importance placed on ICT											
Weak	Raw	15	84	99	8.797	.012	11	81	92	28.711	.000
	%	15.1	84.9	100			12	88.1	100		
Middle	Raw	30	94	124	df = 2		39	88	127	df = 2	
	%	24.2	75.8	100			30.7	69.3	100		
Strong	Raw	81	187	268			115	157	273		
	%	30.2	69.8	100			42.1	57.9	100		
Nationality of the parent company*											
French	Raw	51	125	176	10.206	.006	82	134	216	.872	.647
	%	29	71	100			38	62	100		
Other European	Raw	21	64	85	df = 2		23	46	69	df = 2	
	%	24.7	75.3	100			33.3	66.7	100		
American	Raw	17	14	31			14	19	33		
	%	54.8	45.2	100			42.4	57.6	100		
Size (workforce)											

Less than 500	Raw	74	301	375	68.295	.000	90	287	377	77.160	.000
	%	19.7	80.3	100			23.9	76.1	100		
[500;2000[	Raw	8	38	46			27	21	48	df = 4	
	%	17.4	82.6	100	df = 4		56.3	43.7	100		
[2000;5000[	Raw	5	9	14			7	9	16		
	%	35.7	64.3	100			43.8	56.2	100		
[5000;10000[	Raw	13	5	18			12	2	14		
	%	72.2	27.8	100			85.7	14.3	100		
More than 10000	Raw	27	12	39			31	10	41		
	%	69.2	30.8	100			75.6	24.4	100		
Industry type											
Manufacturing industry	Raw	56	170	226	16.816	.010	67	142	209	6.963	.324
	%	24.8	75.2	100			32.1	67.9	100		
Telecom and services	Raw	13	18	31	df = 6		13	14	27	df = 6	
	%	41.9	58.1	100			48.1	51.9	100		
Finance	Raw	9	9	18			11	17	28		
	%	50	50	100			39.3	60.2	100		
Services B2B	Raw	15	32	47			26	38	64		
	%	31.9	68.1	100			40.6	59.4	100		
Services B2C	Raw	22	65	87			21	49	70		
	%	25.3	74.7	100			30	70	100		
Distribution	Raw	5	39	44			11	35	46		
	%	11.4	88.6	100			23.9	76.1	100		
Others (tourism, transportation…)	Raw	7	32	39			18	34	52		
	%	17.9	82.1	100			47.1	52.9	100		

*No account was taken of Asian and African companies because of their low number (< 5).

Table II. Summary of results

Contingency factors		
Hypotheses	**Results**	
	2002	**2003**
H1: Degree of standardization	Validated	
H2a: Degree of virtualization	Validated	
H2b: Strategic importance of ICT	Validated	
H3: Parent company's nationality	Validated	Not validated
H4a: Size	Validated	
H4b: Industry sector	Validated	Not validated

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Appendix. Operationalization of constructs

Constructs	Measures	Source
Diffusion of an ICT code of conduct	Binary variable: "Has your company diffused a code specific to the use of ICT to employees?" (yes/no)	
Degree of standardization of the company	"Employees use procedures describing work tasks on a daily basis" Respondents were asked to score the degree of their agreement or disagreement on a scale of 1 to 5 (1 = strongly agree, 5 = strongly disagree).	Kalika, 1988; Pugh and Pugh 1976
Degree of virtualization	23 variables to identify the use of several dimensions of virtualization (electronic communication, electronic collaborative work, ERP, CRM, SCM, KM, e-business) Examples of variables: "Videoconference meetings are frequently organized"; "When employees find a solution to a problem, they systematically enter it into a database"; "Stocks are automatically replenished using EDI", etc. For each statement, respondents were asked to score the degree of their agreement or disagreement on a scale of 1 to 5 (1 = strongly agree, 5 = strongly disagree). A principal component analysis then a typology was done, identifying three degrees of virtualization: (1) weak (traditional companies), (2) partial, (3) total (virtual companies)	Isaac, 2002, 2003
Strategic importance placed on ICT	"Top management considers IT to be strategically important" Scale of 1 to 5 (1 = strongly agree, 5 = strongly disagree).	
National culture	"What is the nationality of your parent company?" American, French, European, African, Asian	