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# **The Obligations of Information Systems Professionals: Searching for Consensus**

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## **Introduction**

Nations, institutions and individuals around the world are being irrevocably intertwined and altered by the use of computers and telecommunications. As we move deeper into the information age, information technology (IT) will become increasingly important to accomplish individual, organizational and societal objectives. In today's environment, individuals find it difficult if not impossible to function without having their financial activities coming in contact with database technology. Organizations and entire industries are finding that they can not survive without the modern telecommunications technology. Even the power of countries to regulate their borders and their currency has been drastically diminished as computing and telecommunication technologies have created global electronic markets for goods and services (Wriston, 1992).

As the world moves further into the information age, its reliance on the people who design, develop and work with information and communication technologies escalates. IS professionals, as gatekeepers of the technology, control access to the basis of wealth and prosperity. Their technological expertise grants them both unique power and responsibility to their users, organizations and societies. The autonomy and respect that communities afford traditional professions is based on the mutual recognition of the obligations of the profession. While there have been attempts by organizations such as the ACM and the DPMA, there is still no general consensus on IS professional responsibilities (Oz, 1992).

This study is designed to search for a consensus on the responsibility of the IS professional. To examine the responsibilities of information systems professionals as perceived by the IS professional, employers, and users throughout the world, this study, through a survey of 683 managers, users and IS professionals, examines the degree of consensus of the perceived responsibilities of information systems professionals to their employers, users and societies.

## **Background**

While it has been proposed that IS professionals need to "adopt a single, coherent, international code of ethics for the information systems community" (Oz 1992; p. 423), the issue is complicated by the conflicting demands of the effected constituents (Johnson, 1991). Parker (1979) stated that we should contend for "a consensus on the application of ethics to the computer field before we start writing codes of ethics, rather than after" (p. 49). This would require the identification of both the obligation and the constituent. Johnson (1985) proposed four constituencies: society, employers, clients, and colleagues. Mason (1986) identified the bases of obligations in terms of four specific concerns: privacy, accuracy, access and intellectual property rights.

## **Obligations**

In his 1986 note, Richard Mason identified four issues that should be addressed in the information age. These issues are sure to stimulate much public debate in and outside of the courtroom as business and society begin to cope with their implications and realities. He stated that "information forms the intellectual capital from which human beings craft their lives and secure dignity" (p. 5). A person's intellectual capital can be violated when information technology is misused inhibiting a person's right to keep certain data

items private (privacy), to maintain the accuracy of these items (accuracy), to assure ownership of intellectual property (property), and to have access to the information (access).

Mason's four issues form the first dimension of our typology. Because of its importance to our study, each issue is defined more completely below:

*Information privacy* is concerned with the determination of what information a person should be required to divulge and how that information should be safeguarded. These concerns have been complicated by: modern database technology that allows the aggregation of data in two or more personal databases resulting in a more comprehensive profile of an individual; and telecommunication technology which allows information to be transferred at the speed of light to and from cultures and countries that may define privacy in drastically different terms.

*Information accuracy* has become increasingly important both in terms of how the data is used, stored and processed. Modern society is permeated with stories of how credit histories have been damaged by faulty information and how innocent citizens have been arrested due to mistaken identification.

Information as *property* is not only a question of who owns the information, but also who owns the media by which the data is transferred. Modern society is discovering that the all seeing eye of "big brother" can just as easily belong to an ingenious marketer as a tyrannical dictator.

*Access* to information in the information age may not be just a question of personal privacy, but also of economic and social survival. In a world based on information, the question of who controls access can be as important as who controlled the shipping lines and roads in past centuries (Dejoie, Fowler and Paradise, 1991).

## **Constituents**

Obligation identification becomes even more complicated when it is framed in terms of the various constituents (e.g. employers, system users, and society) that may demand conflicting allegiance from IS professionals (Johnson, 1991). For example, an employer may want a system operator to violate an employee's privacy by monitoring his electronic mail. To whom and to what degree is the IS professional responsible? Does his allegiance belong first to the employer at the potential expense of a system user? In a broader sense, what is the cumulative effect of similar dilemmas on society as a whole? Are our ethical standards changing due to the new context provided by technology in the information age? The traditional domain and study of MIS ethics (software piracy, system security, etc.) should expand by encouraging discussion and debate on the responsibilities of IS professionals to various constituents.

In this vein, the IS constituents identified first by Johnson (1985) and later discussed by Oz (1992) will form the second dimension of our typology. Again, the importance of this dimension to our study warrants further definition of each constituent.

That an employee has an obligation to his *employer* is indisputable in the obvious sense. The very nature of the employment relationship is contractual, both sides agreeing to perform certain actions in order to comply. The ethical dilemma occurs when protecting the employer's interests violates the rights of other constituents. In addition, the specialized expertise of the IS professional may make it impossible for the employer to evaluate, monitor or scrutinize the IS employee's work.

The relationship between the IS professional and the *system user* has been examined in many contexts (user involvement, user satisfaction, etc.). Understanding of the ethical responsibility of the IS professional to the user, however, is blurred. To what extent is the IS professional responsible for identifying to the user potential ethical violations of the system? Is the IS professional responsible for the unethical use of a system by a user? How does the IS professional resolve conflicting obligations to employer and user?

Finally, an IS professional's *societal* obligation can be viewed as the cumulative effect of the professional's work on the welfare of the public. Information systems have a great impact on the security, privacy and economic interests of all people (Oz, 1992). How does the IS professional answer the challenge of valuing the good of the public above the interests of other constituents?

## Hypotheses

1. It is anticipated that the recipient of a benefit will tend to perceive that obligation more intensely than the nonrecipients.

1.1 IS managers will perceive that IS professionals have a greater obligation to employers than will IS staff or IS users.

1. IS users will perceive that IS professionals have a greater obligation to users than will IS managers or IS staff.

1.3 IS users will perceive that IS professionals have a greater obligation to society than will IS staff or IS managers.

## Methodology

The instrument was created through a multistep interactive process emphasizing the development of valid and reliable construct measures. To develop a valid set of questions, a series of item development procedures was followed. First, items were grounded in previous research. Based on the works of Mason (1986), Johnson (1985) and Oz (1992), candidate items for the typology were generated. Next, the semantic content of the items and the survey format were repeatedly refined as the result of a series of interviews with information systems professionals. This multi-phase instrument development process attributed reasonable face validity to the instrument. A set of 33 questions was developed through this process. Finally, to more rigorously assess the reliability and validity of the scales, a pre-test administration of the survey to students in an undergraduate computer information systems course was conducted. Pretest results indicated acceptable psychometric properties of the scales. In addition, debriefing interviews with respondents affirmed the readability and format of the instrument and led to the rewording of a number of questions.

Each subject received an electronically delivered survey to their electronic mail address. Despite the novelty of electronically delivered surveys, there is no reason to believe that the results are systematically biased (Williams, Rice & Rogers, 1988). Empirical studies have also shown that there is no significant difference between paper and electronic answers and that when given a choice, subjects preferred the electronic survey over the paper format (Liefeld, 1988).

A frame of 35,000 Internet users from international educational, military, and corporate institutions was used. A random sample of 3133 usable addresses was chosen from the list of individual Internet users and the survey was delivered electronically to their accounts. Six hundred and eighty three usable surveys were returned from 40 different countries yielding a response rate of 21.8 per cent. Subjects classified how they related to computer-based information systems using a categorical scale consisting of IS manager, end user, one of a series of IS staff functions (systems analysis, systems/application programmer, computer operator, etc.), or other. The respondent's perception of IS professional obligation to users, employers and society was measure using an eight item construct. Each eight item construct consisted of two items measuring privacy, property, access, and accuracy. The three constructs were determined to have acceptable alpha coefficients as noted in Table 1.

## Results

The research hypotheses were examined through a one-way analysis of variance and Levene's technique was used to determine that non-homogeneity of cell variance was not a limitation. The analysis showed significant differences between perceived obligation to employers ( $F=7.15$ ,  $df = 2/582$ ,  $p<0.01$ ), users ( $F=6.93$ ,  $df= 2/574$ ,  $p<0.01$ ), and society ( $F=6.58$ ,  $df= 2/574$ ,  $p<0.01$ ) by IS managers, IS staff and end users. Group differences were further examined through multiple comparison analysis as summarized in Table 1. Hypothesis 1.1 was supported by the analysis. Hypotheses 1.2 and 1.3 were only partially supported because IS managers' perceptions of IS obligation to users and society was not significantly lower than the of obligation perceived by users.

<b>Multiple Comparison Test of Perceived Obligation Table 1.</b>					
<b>Obligation to</b>	<b>Ave</b>	<b>Num</b>	<b>IS User</b>	<b>IS Mgmt</b>	<b>IS Staff</b>
<b>Employer ( = 0.78)</b>	.	.	.	.	.
IS End User	5.71	171	.	.	.
IS Manager	5.96	81	*	.	*
IS Staff	5.60	333	.	.	.
<b>User ( = 0.71)</b>	.	.	.	.	.
IS End User	5.61	166	.	.	*
IS Manager	5.58	80	.	.	.
IS Staff	5.35	331	.	.	.
<b>Society ( = 0.82)</b>	.	.	.	.	.
IS End User	4.95	166	.	.	*
IS Manager	4.77	80	.	.	.
IS Staff	4.57	331	.	.	.

\* Significance level of  $p < 0.50$  using test Tukey-HSD test

## Discussion

The increasing importance and pervasiveness of computer based information systems has made the role of IS professionals critical to modern civilization. This has brought forth a call for the development of a set of universal standards for defining the responsibilities of IS professionals. This study provides a step in this process by presenting an examination of the relationship between IS constituents and the perceived obligation of IS professionals.

The anticipated hypotheses were based on an assumption that self interest would be a primary motivator in the recognition of obligations (i.e. that the recipient of a benefit will perceive an obligation more intensely than the obligator). It is interesting to note that even though the average obligation scores were as

anticipated, IS managers perceived IS professional obligations more intensely than hypothesized. Further research is needed to determine if this is the result of altruism or the perception that as IS managers they would be beneficiaries of employee professionalism.

This study is of potential benefit to researchers and practitioners by developing a typology and measuring the perceived obligations of IS constituents. While it measured the perceived obligation of the IS professional it did not examine the benefits that would be awarded the IS profession if it were to recognize its responsibilities and formalize its professional status in the form shared by lawyers, physicians and accountants. It is also important to note that the external generalizability of the findings of this study may be limited by the use of Internet users as the sample base.

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