



Ethical Standards for Information Systems Professionals – 30 Years After “A Case for a Unified Code”

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Abstract:

Technological advances increasingly mark our society but also bring with them unique ethical challenges. In 1992, a paper entitled “Ethical Standards for Information Systems Professionals: A Case for a Unified Code” by Effy Oz was published in MISQ. Since then, much has happened in the area of technologies and information systems. New business contexts, methodological approaches, technologies, applications, and many other changes have occurred, requiring a renewed attention to ethical concerns and warranting a revisiting of the theme 30 years later. This paper follows the same structure and methodological approach as used in Effy Oz’s work, focusing on the current versions of the ethical codes of leading organizations. The objectives are as follows: (1) to reflect on the changes made to the codes over 30 years, (2) to examine whether the recommendations proposed in Oz’s original work are reflected in the current versions of the codes, and (3) to conclude if the need for a unified code of ethics still prevails. The results indicate that, depending on the organization, the impact of the “passage of time” on the codes was different; several recommendations — which are still valid — are not fully reflected in the documents, thus continuing the need for a unified code of ethics (albeit with some different characteristics from those identified three decades ago).

Keywords: Ethics, Deontology, Code of Ethics, Information Systems, Information Systems Professionals.

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1 Introduction

Almost thirty years have passed since Effy Oz's work (Oz, 1992) was published in MISQ under the title “Ethical Standards for Information Systems Professionals: A Case for a Unified Code.” At the time, based on the guidelines proposed by Johnson (1985), Oz reviewed the codes of ethics of five organizations: Data Processing Management Association (DPMA), Institute for Certification of Computing Professionals (ICCP), Association for Computing Machinery (ACM), Canadian Information Processing Society (CIPS), and British Computer Society (BCS). This analysis resulted in six recommendations that any code of ethics should include. The proposal for a unified code of ethics arose from the need for Information Systems (IS) professionals to follow similar rules and “in the hope of inspiring ... organizations to eliminate differences and establish a ‘Hippocratic oath’ for the entire IS community” (Oz, 1992, p. 423).

The world is a “considerably” complex and constantly changing environment (Agresti, 2004), leading to changes in people, organizations, and society, and consequently in their behavior. This, in turn, implies new challenges and dilemmas of an ethical nature. The technological, contextual, and behavioral changes require reviewing, updating, and rewriting existing codes of ethics (Weckert, Lucas, & Selgelid, 2013).

For instance, personal data processing and personal data free movement resulted in a change of individual and organizational behaviors in recent years. The fundamental right of “protection of natural persons with regard to the processing of personal data” was updated in the European Union's Directive 95/46/EC on April 27, 2016 (EU, 2016): “Directive 95/46/EC of the European Parliament and the Council seeks to harmonize the protection of fundamental rights and freedoms of natural persons in respect of processing activities and to ensure the free flow of personal data between the Member States.” The current change in work habits and environments due to the COVID-19 pandemic is another good example of disruption from a previous paradigm, requiring adjustments from employers, employees, clients, and other stakeholders and even a higher sense of responsibility.

This reality brings new ethical challenges for organizations and professionals that need to be reflected in the codes of ethics. As a result, several organizations have been implementing updates to their codes, making it relevant to periodically revisit the topic to analyze whether assumptions have changed, new ethical concerns have arisen, or certain concerns still remain. Some examples of recent updates are the codes from the Australian Computer Society (ACS, 2021), the Associazione Italiana per l'Informatica ed il Calcolo Automatico (AICA, 2015), the Computer Society of India (CSI, 2021), and the International Federation for Information Processing (IFIP, 2021), just to name a few.

This research aims to analyze the most recent versions of three codes of ethics (from ACM (ACM, 2018), CIPS (CIPS, 2018), and BCS (BCS, 2021)), following the same methodological approach as used by Oz (1992). The objectives are (1) to analyze the changes made to each of these three codes over the past thirty years, (2) to examine whether Oz's recommendations are reflected in the current versions of the codes, and (3) to verify whether the need for a unified code of ethics remains.

It is also aimed as a call for all professionals working on information systems to be aware of and familiar with these moral codes given the growing concerns over ethical challenges amidst the tremendous variations in the digital landscape that sometimes question values and purposes.

The paper is structured into four sections, in addition to the introduction. Section 2 presents the organizations that publish the analyzed ethical codes. Section 3 describes the method followed in the work. Section 4 discusses the main results obtained, comparing them with the results of Oz's paper (Oz, 1992). The conclusions are presented in section 5, including the limitations of the study and future research suggestions.

2 The Organizations

The five organizations and codes identified by Oz (1992) are listed in Table 1 and described next. These organizations were selected by Oz (1992) because they “are among the world's most prominent IS professional associations,” and other similar organizations (that also have codes) promote the same objectives. From the five codes originally analyzed by Oz (1992), only three were considered in this paper, since two of them are no longer maintained.

Table 1. Organizations and Codes

	Society	Date of foundation	Code	Date of the code analyzed by Oz	Date of the code analyzed in our study
CIPS	Canadian Information Processing Society	1958	Code of ethics and standards of conduct	1985	2018
ACM	Association for Computing Machinery	1947	Code of ethics and professional conduct	1992	2018
ICCP	Institute for Certification of Computer Professionals	1973	Code of ethics	-	NA
DPMA	Data Processing Management Association	1951	Code of ethics and standards of conduct	-	NA
BCS	British Computer Society	1957	Code of conduct	1992	2021

Note: NA = Not Analyzed in this paper since it is no longer maintained.

CIPS

The Canadian Information Processing Society (CIPS) was established in 1958. Having emerged as “The Computing and Data Processing Society of Canada,” the name changed to CIPS in 1968. It has a strong association in the Information Technology (IT) industry in Canada, serving thousands of IT professionals. CIPS offers networking opportunities, certification of IT professionals, accreditation of IT university and college programs, among others. CIPS created its original code of ethics and conduct in 1985 and updated it in 2005 (CIPS, 2005). The last update occurred in 2018 (CIPS, 2018), which is the version analyzed in our study.

ACM

The Association for Computing Machinery (ACM) is the oldest educational and scientific computing society. Founded in 1947, it is an international scientific and educational organization dedicated to advancing the art, science, engineering, and application of IT, serving both professional and public interests by fostering the open interchange of information and promoting the highest professional and ethical standards. The first code of the association came out in 1972. The association is currently governed by the code updated in 2018 (ACM, 2018), which had already undergone changes in 1992 (Berleur & Brunnstein, 1996).

ICCP

Since its creation in 1973, the Institute for Certification of Computing Professionals (ICCP) has been a reference for professionals in the information, communication, and technology sector. Its vision is committed to accelerating business, technical training, certification, and evaluation, all deemed essential for workforce leaders (ICCP, 2021). There are several certifications currently offered by the ICCP — for example, blockchain certifications, big data professional, certified analytics professional, certified computing professional, certified data professional, and cybersecurity professional. Contrary to Oz's (1992) study, the ICCP code was not directly considered in our study, since the organization decided to adopt ACM's code of ethics and professional conduct (ACM, 2018; ICCP, 2018).

DPMA

Founded in 1951, the Data Processing Management Association (DPMA) changed its name in 1997 to Association of Information Technology Professionals (AITP). Currently, it is named CompTIA (CompTIA, 2020). CompTIA's focus areas are as follows: membership, education, certification, advocacy, philanthropy, media, and industry partners. After an exhaustive search, only the code already analyzed by Oz (1992) was found. Since the code is not available on the organization's current website, a request was sent via email to obtain the document. CompTIA responded by stating that it does not currently have a

code of ethics for the information technology area. For this reason, although it was considered in Oz's study, it is not discussed in our study.

BCS

Formed in 1957, the British Computer Society (BCS) is based on five strategic pillars: supporting careers, sharing expertise, improving education, influencing practice, and driving standards. Since the association's code came into being in 1978 (Berleur & Brunnstein, 1996), several updates have been made (for instance, in 1984 (Berleur & Brunnstein, 1996), 1992 (Berleur & Brunnstein, 1996), 2015 (BCS, 2015), and 2021 (BCS, 2021)). The 2021's version (version 7) is the one analyzed in this study.

Summing up, considering the changes in codes and institutions in recent years, the codes of ethics analyzed in the next sections belong to ACM (ACM, 2018), CIPS (CIPS, 2018), and BCS (BCS, 2021). All the codes analyzed refer to their most recent version. As aforementioned, the original ICCP's and DPMA's codes are no longer maintained, and therefore are not considered in our replication study.

We focus attention on these codes to make a parallel with Oz's paper. However, it should be noted that other codes exist beyond those mentioned — for example, from the Institute of Electrical and Electronics Professionals (IEEE, 2018), IT Professionals New Zealand (ITPNZ, 2017), or Singapore Computer Society (SCS, 2021).

3 Evaluation Framework

Taking into account the study's objective, the methodological approach was the same as Oz used and was based on the obligations established by Johnson (1985) to analyze codes of ethics and conduct. These include obligations to society, obligations to employer, obligations to clients, and, lastly, obligations to colleagues and professional organizations. Oz (1992) divided the latter into three different but related obligations: obligations to colleagues, obligations to the organization, and obligations to the profession.

Thus, after identifying and obtaining the last version of the codes selected for analysis, they were compared to identify their differences and similarities, considering the six types of obligations:

1. Obligations to society;
2. Obligations to employer;
3. Obligations to clients;
4. Obligations to colleagues;
5. Obligations to the organization;
6. Obligations to the profession.

The analysis process was as follows. Firstly, each document was analyzed separately by the authors to extract the guidelines. The coding was carried out using MAXQDA 2020. Secondly, the coding results were discussed by the authors to reach an agreement. In the third step, and in a blind way, each author organized the codes according to the types of obligations. In the end, these results were again compared and discussed, until the authors arrived at a final agreement. Table 2 shows a summary of the obligations contained in the codes of conduct analyzed in this study. Note that the organization of the table does not reflect the original structure of the codes (i.e., the “obligations to” do not correspond to sections headings of the codes), and that some of the conducts can be placed in more than one type of obligation.

Table 2. Characteristics of Professional Ethical Codes

Obligation to:	ACM (ACM, 2018)	CIPS (CIPS, 2018)	BCS (BCS, 2021)
Society	<p>To contribute to society and human wellbeing, acknowledging that all people are stakeholders in computing.</p> <p>Avoid “harm” to other people.</p> <p>Be honest and trustworthy.</p> <p>Be fair and take action not to discriminate.</p> <p>Respect the work required to produce new ideas, inventions, creative works, computer artifacts, and respect copyrights, patents, trade secrets, license agreements, and other methods of protecting authors’ works.</p> <p>Respect the privacy associated with the collection and use of personal information.</p> <p>Foster public awareness and understanding of computing, related technologies, and their consequences.</p> <p>Access computing and communication resources only when authorized or when compelled by the public good.</p> <p>Design and implement systems that are robustly and usably secure.</p> <p>People’s good must be the central concern during all professional computing work.</p> <p>Articulate, encourage acceptance of, and evaluate fulfillment of social responsibilities by members of an organization or group.</p> <p>Recognize and take special care of systems that become integrated into the infrastructure of society.</p>	<p>Protect the public interest and privacy of information.</p> <p>Carry out work or study with primary regard for the public interest.</p> <p>Report to the relevant authority problems that might result in serious damage to persons, organizations, property, or the economy.</p> <p>Work in accordance with the legitimate rights of third parties and conduct all activities with due respect to the property, property rights, and privacy.</p> <p>Give credit where credit is due on all reports, documents, and ownership of the code and designs.</p> <p>Understand and comply with obligations imposed on them under applicable privacy legislation.</p> <p>Not discriminate in any manner.</p> <p>Adopt values of equality, tolerance, and respect for others.</p> <p>Notify all parties involved and make full disclosure to the relevant authority if any conflict arises.</p> <p>Not place personal interests or those of colleagues above interests of employers/clients, nor place any interests above those of the public.</p> <p>Tell the truth and avoid misrepresentation.</p> <p>Be honest and sincere.</p> <p>Have integrity.</p> <p>Work to enhance the public’s understanding of information systems and their current capabilities and limitations.</p> <p>Carry out in accordance with regulatory requirements and legislation.</p>	<p>Have due regard for public health, privacy, security, and wellbeing of others and the environment.</p> <p>Have due regard for the legitimate rights of third parties.</p> <p>Perform professional activities without discrimination.</p> <p>Promote equal access to the benefits of IT and seek to promote the inclusion of all sectors in society wherever opportunities arise.</p> <p>Have knowledge and understanding of the legislation, and comply with such legislation in carrying out the professional duties.</p> <p>Avoid injuring others, their property, reputation, or employment by false or malicious or negligent action or inaction.</p>

Table 2. Characteristics of Professional Ethical Codes

Employer	<p>Honor confidentiality. Know and respect existing rules pertaining to professional work. Give comprehensive and thorough evaluations of computer systems and their impacts, including analysis of possible risks. Leaders should manage personnel and resources to enhance the quality of working life. Leaders should articulate, apply, and support policies and processes that reflect the principles of the code. Leaders should create opportunities for members of the organization or group to grow as professionals. Leaders should take care when modifying or retiring systems.</p>	<p>Take professional responsibility, serving employer competently, carrying out the work with due diligence. Treat all employer business information as confidential, respect copyrights, trade secrets, privacy and terms of license agreements. Not place personal interests or those of colleagues above interests of employers, nor place any interests above those of the public.</p>	<p>Carry out professional responsibilities with due care and diligence in accordance with the requirements of the relevant authority. Seek to avoid any situation that might give rise to a conflict of interest. Accept professional responsibility for your work and for the work of colleagues who are defined in a given context as working under your supervision. Not disclose or authorize to be disclosed, or use for personal gain or to benefit a third party, confidential information. Not misrepresent or withhold information on the performance of products, systems, or services. Not take advantage of the lack of relevant knowledge or inexperience of others.</p>
Clients	<p>Honor confidentiality. Give comprehensive and thorough evaluations of computer systems and their impacts, including analysis of possible risks.</p>	<p>Take professional responsibility, serving clients competently, carrying out the work with due diligence. Treat all client business information as confidential, respect copyrights, trade secrets, privacy and terms of license agreements. Not place personal interests or those of colleagues above interests of clients, nor place any interests above those of the public. Balance quality and cost in a very transparent way (quality includes meeting the requirements of the client and meeting their need for timeliness). Follow policies and procedures of the client, including procurement. Follow the client's code of business conduct and any contract requirements.</p>	<p>Same obligations as to employers.</p>

Table 2. Characteristics of Professional Ethical Codes

Colleagues	Encourage and support the high-quality work (both processes and products) of colleagues.	Support professional development for current and new CIPS members, potential members, colleagues, and subordinates. Maintain respectful workplace relationships.	Act with integrity and respect in your professional relationships with all members of BCS and with members of other professions with whom you work in a professional capacity. Encourage and support colleagues in their professional development.
The professional organization or its members	To defend, promote and respect the principles of the Code. Consider reporting violations of the code to the ACM, which may result in remedial actions.	Act in a manner that upholds the reputation of CIPS and the IT profession in general, in relationships with anyone with whom they work. Make all reasonable efforts to counter misinformation that could bring the IT profession or CIPS into disrepute.	Uphold the reputation and good standing of BCS. If a member of BCS should know of, or become aware of, any breach of this Code of Conduct by another member, they are under an obligation to notify BCS immediately.
Profession	Strive to achieve the highest quality in the process and products of professional work. Maintain and update high standards of professional competence, conduct, and ethical practice. Accept and provide the appropriate professional review. Perform the work only in areas of competence.	Contribute to the IT profession. Maintain objective integrity and independence in professional judgment. Take responsibility for results. Achieve and maintain professional competency in area(s) of practice. Demonstrate the knowledge needed to undertake work, comply with relevant legislation and accepted standards of practice. Make reasonable efforts to voluntarily participate in activities such as the development of standards of practice and advancements in bodies of knowledge. Be fair to competing vendors.	Only undertake to do work or provide a service that is within your professional competence. Do not claim any level of competence that you do not possess. Develop your professional knowledge, skills and competence on a continuing basis, maintain awareness of technological developments, procedures, and standards that are relevant to your field. Respect and value alternative viewpoints. Seek, accept and offer honest criticisms of work. Reject and will not make any offer of bribery or unethical inducement. Accept your personal duty to uphold the reputation of the profession. Not take any action which could bring the profession into disrepute. Seek to improve professional standards through participation in their development, use, and enforcement.

Sanctions	Consequences not specified in the code.	Violators may be subject to disciplinary action, including, but not limited to, suspension or termination of the association and/or professional certification. Lack of awareness does not excuse unethical behavior. (the procedure is clear)	Any violation of the Code of Conduct brought to the attention of the BCS, or of which the BCS becomes aware, will be considered under the Institute’s disciplinary procedures. (the procedure is clear)
List of Definitions	Not included	Included	Included
Guidance to Members	Not offered	Offered	Not offered
Priority of Constituents	Not defined	Defined	Not defined

Similarly to Oz’s paper, the obligations serve as a framework in the following analysis, corresponding to sections 3.1 to 3.6. Sections 3.7 and 3.8, also following Oz’s paper, refer to sanctions against violations, as well as definitions, guidance, and priorities. For each obligation, the reconceptualization of the “issue” based on Oz’s definition is first presented, and then the similarities and differences found in the current versions of the codes are discussed.

3.1 Obligations to Society

The issue:

Professionals should consider and protect people’s welfare, inclusion, ownership, security, privacy, legislation, environment, and society overall when performing their job. Professionals should be honest and trustworthy, respect each other, and put the public’s interests first.

Similarities and differences:

At least two of the three codes identified the following conducts, even if written differently:

- Protect the welfare of people and the environment (ACM, 2018; BCS, 2021; CIPS, 2018);
- Not discriminate (ACM, 2018; BCS, 2021; CIPS, 2018);
- Avoid injuring other people (ACM, 2018; BCS, 2021);
- Be honest, trustworthy, and sincere (ACM, 2018; CIPS, 2018);
- Protect information privacy (ACM, 2018; BCS, 2021; CIPS, 2018);
- Know, understand and respect the legislation (ACM, 2018; BCS, 2021; CIPS, 2018);
- Respect the legitimate rights of others (BCS, 2021; CIPS, 2018);
- Respect the copyrights, patents, and other methods of protection of authors’ works (ACM, 2018; CIPS, 2018);
- Improve the public understanding of computing, its consequences and limitations (ACM, 2018; CIPS, 2018).

Some conducts, although equally essential, only appear in one of the codes:

- Not place personal interests or those of colleagues above interests of employers/clients, nor place any interests above those of the public (CIPS, 2018);
- Report any problem to the competent authorities and notify all parties involved (CIPS, 2018);
- Give credit where due in all reports, documents, and ownership of the code and design (CIPS, 2018);
- Seek to promote the inclusion of all sectors of society (BCS, 2021).

All codes are initiated by mentioning the public interest. For example, the ACM code (ACM, 2018) states that “all people are stakeholders in computing” and that the computer professional should “minimize negative consequences of computing, including threats to health, safety, personal security, and privacy.”

The CIPS code (CIPS, 2018) states that the primary regard should be “public interest (including health, security, safety, privacy, protection of the environment and social responsibility)” when undertaking work or study. BCS’s code (BCS, 2021) advises that consideration should be given to “public health, privacy, security and wellbeing of others and the environment.”

Another noteworthy aspect that the codes have in common is “non-discrimination” conduct. In all three codes, it is outstanding and detailed conduct, and several possible types of discrimination are identified. For example, the CIPS’ code (CIPS, 2018) states the following: “not discriminate in any manner based on issues such as race, religion, sex, sexual orientation, age, disability, national origin, or social class.”

Three conducts that are in only one code stand out. The first two are included in the CIPS’ code (CIPS, 2018): “[Do] not place personal or those of colleagues above interests of employers/clients, nor place any interests above those of the public”; and “report to the relevant authority problems that might result in serious damage to persons, organizations, property or the economy.” The CIPS’ code (CIPS, 2018) is the only one that details the hierarchy of conflicts of interest.

The conduct “reporting problems” relates to “persons, organizations, property or the economy,” and even though it is supposed to be an “obvious” conduct, it is important to stress that any issue that could harm others must be reported and notified.

Finally, the conduct “to promote the inclusion of all sectors of society” is only described in the BCS’ code (BCS, 2021), together with the conduct “to promote equal access to the benefits of IT.” As the code is the most recent of the three, it is noticeable that there is an increasing concern for the inclusion of other sectors with IT.

3.2 Obligations to Employer

The issue:

An employer hires a professional with the expectation that s/he will add value to the company, accept and act according to the associated responsibilities, honor confidentiality, and protect the employer’s interests. In some cases, the professional’s obligations to the employer may also be related to other stakeholders (e.g., in the case of outsourcing).

Similarities and differences:

The three codes share similar conducts related to the obligations to the employer, even if written differently:

- Carry out professional responsibilities with due care and diligence (ACM, 2018; BCS, 2021; CIPS, 2018);
- Honor confidentiality (ACM, 2018; BCS, 2021; CIPS, 2018).

There are also other related conducts. For instance, according to the CIPS’ code (CIPS, 2018), personal interests or those of colleagues should not be placed above the interests of employers. And the BCS (2021) code states that situations that might give rise to a conflict of interest should be avoided.

Additionally, ACM (2018) and BCS (2021) codes specify the commitments of a “leader”, directly or indirectly related to the employer. Starting with the ACM’s code (ACM, 2018), it emphasizes that leaders should ensure “quality of working life,” considering, for example, that “leaders should create opportunities for members of the organization or group to grow as professionals.” It also adds that a leader “should take care when modifying or retiring systems,” since those actions may affect the employer or other entities. BCS (2021) also contains a conduct aimed at fulfilling professional responsibilities, namely, “accept professional responsibility for your work and for the work of colleagues who are defined in a given context as working under your supervision.” It also mentions to “not take advantage of the lack of relevant knowledge or inexperience of others.”

3.3 Obligations to Clients

The issue:

Clients are individuals or businesses that acquire a company’s goods or services. The obligations to the employer and the clients are identical because a professional (employee) in failing to meet contractual or ethical obligations may harm not only the employer but also the client.

Similarities and differences:

The BCS' code (BCS, 2021) states that the relevant authority “is normally an employer or client” and therefore has the same conduct as in the obligation to the employer. The CIPS' code (CIPS, 2018) states that “quality includes meeting the requirements of the client.” It also adds: “follow policies and procedures of client including procurement”, as well as “follow client’s code of business conduct, and any contract requirements.”

The ACM (2018) mentions that if “the professional identifies a lack of a necessary expertise, they must disclose this to the employer or client”, and that “the client or employer may decide to pursue the assignment with the professional after additional time to acquire the necessary competencies, to pursue the assignment with someone else who has the required expertise, or to forget the assignment.” It also states that a computer professional must honor confidentiality and respect confidential information such as trade secrets and client data. This is in line with the CIPS' code (CIPS, 2018), which states to “treat all client business information as confidential, respect copyrights, trade secrets, privacy and terms of license agreements.”

Moreover, the CIPS' code (CIPS, 2018) adds the following conducts: “Take professional responsibility, serving clients competently, carrying out the work with due diligence”, and “not place personal interests or those of colleagues above interests of clients.”

3.4 Obligations to Colleagues

The issue:

Professionals share many common interests, and it is expected that they act with respect and encourage and support their colleagues' high-quality work and professional development, as well as helping each other.

Similarities and differences:

Oz (1992) makes an interesting reflection, which starts with the following example: “In some countries, it is practically impossible to convince a doctor to testify against a fellow doctor, in cases of medical negligence.” None of the current versions of the three codes promotes this kind of “loyalty.” Besides, there is still an incentive to denounce misbehaviors, as members of CIPS and BCS are obliged to report any unethical behavior or a violation of their codes by other members. Currently, the obligation to colleagues is more directed towards professional development. ACM (2018), CIPS (2018), and BCS (2021) share a conduct aimed at encouraging and supporting the high-quality work and professional development of colleagues.

The CIPS (2018) and BCS (2021) codes further add that one must act with respect and integrity towards all professional relationships.

3.5 Obligations to the Organization

The issue:

Professional organizations (e.g., ACM, CIPS, and BCS) require their members to act in a manner that upholds the organization's reputation and the IS profession in general and report any violation that may bring them into disrepute.

Similarities and differences:

The CIPS (2018) and BCS (2021) codes share similar conduct, even if written differently, and are as follows:

- Act in a way that maintains the reputation of the organization (CIPS, 2018);
- Maintain the reputation of the profession (BCS, 2021).

These and other conducts are common both for the “profession” and the “professional organization.” ACM's and BCS' members shall consider reporting the violation of the code to their organization. Another conduct that ACM's members should follow is to “defend, promote and respect the principles of the code.”

3.6 Obligations to the Profession

The issue:

A professional should strive to achieve the highest quality in the process and products of work, perform work only in areas of competence, seek to continuously improve professional standards, develop knowledge, skills, and competence on a continuing basis, and not engage in any behavior or action that could harm the profession.

Similarities and differences:

Regarding this obligation, several similar conducts were also identified in the three codes, even if written differently, as follows:

- Maintain and update professional competence (ACM, 2018; BCS, 2021; CIPS, 2018);
- Perform the work or service only in areas of competence (ACM, 2018; BCS, 2021);
- Improve professional standards (BCS, 2021; CIPS, 2018);
- Accept and offer appropriate professional review (ACM, 2018; BCS, 2021).

Other conducts stand out, although they appear in only one of the codes, namely:

- Strive to achieve the highest quality in the process and products of professional work (ACM, 2018);
- Maintain objective integrity and independence in professional judgment (CIPS, 2018);
- Accept your personal duty to uphold the reputation of the profession (BCS, 2021);
- Not take any action which could bring the profession into disrepute (BCS, 2021);
- Do not claim any level of competence that you do not have (BCS, 2021);
- Be fair to competing vendors (CIPS, 2018);
- Reject and make no bribery offer (BCS, 2021).

3.7 Sanctions Against Violations

The issue:

Sanctions included in codes define what happens when a member violates the organization's code of ethics. Depending on the severity of the violation, different penalties apply and may include suspension or termination of membership.

Similarities and differences:

All organizations refer to sanctions against violators of the standards of ethical conduct, although in the case of ACM, the consequences are not specified in the code (ACM, 2018), mentioning only that "ACM members who recognize a breach of the Code should consider reporting the violation to the ACM, which may result in remedial action as specified in the ACM's Code of Ethics and Professional Conduct Enforcement Policy." In the CIPS (2018) and BCS (2021) codes, the possible consequences are described. In the case of the CIPS (2018) code, "violators may be subject to disciplinary actions including but not limited to suspension or termination of membership and/or professional certification." And, in the case of BCS (2021), violations "can result in expulsion from membership." To note that "lack of awareness does not excuse unethical behavior" (CIPS, 2018).

3.8 Definitions, Guidance, and Priorities

3.8.1 Definitions

CIPS and BSC present in their codes a list of expressions and their respective definitions. The same concept may have different definitions in the two codes, as they apply to different contexts. For example, "Relevant authority" is defined in the CIPS' code (CIPS, 2018) as "a person or group with jurisdiction over directly related areas of concern," and in the BCS' code (BCS, 2021) is defined as "the person(s) or organization(s) which has/have authority over the activity of individuals in their professional capacity. For practicing BCS members, this is normally an employer or client. For student members, this is normally an

academic institution.” Therefore, the existence of a “Definitions” section is important as it clarifies the terms of each conduct making the information clearer for users. The ACM’s code (ACM, 2018) does not currently have a list of definitions.

3.8.2 Guidance

It is expected that codes will guide professionals as to what they should do in case a doubt arises about the content of the code (Oz, 1992). However, only the CIPS’ Code (CIPS, 2018) offers guidance in this regard: “In the process of ethical decision making, when in doubt, CIPS members should seek clarification and guidance on how to interpret the Code of Ethics” and may request “interpretation, clarification or amplification of any part of the Code of Ethics” to the Registrar’s Office of CIPS. The CIPS’ code (CIPS, 2018) also details the steps that members should take “when making ethical decisions and resolving ethical dilemmas.”

BCS (2021) and ACM (2018) codes are not clear in this regard. For example, in the case of BCS (2021), it is only referred that “members are expected to exercise their own judgment (which should be made in such a way as to be reasonably justified) to meet the requirements of the code and seek advice if in doubt.”

3.8.3 Priorities

“An architect, when he realizes that a building does not meet safety standards, does not proceed with his work to protect the public, even if this may conflict with his obligations to the employer or client. A doctor’s priority is his patient, that is, the client” (Oz, 1992). In the case of IS professionals, it is also important, when a conflict arises, to define those who should be prioritized. Only the CIPS’ code (CIPS, 2018) is clear in presenting an order of priority, placing the public above all interests. The hierarchy of priorities is shown in the following way: “Not place personal interests or those of colleagues above interests of employers/clients, nor place any interests above those of the public (if this hierarchy causes conflict you have an ethical dilemma).” The ACM’s code (ACM, 2018) does not clarify any order of priorities, stating only that “the public good is always the primary consideration.” The BCS’ code (BCS, 2021) does not describe an order of priority either.

4 Discussion

This section compares the two studies, the one carried out in this paper and the one originally carried out by Oz (1992) three decades ago, to provide a better understanding of the changes that have occurred.

4.1 Comparison of the Two Analyses

Several types of changes are noticed: modification of the content of conducts (maintaining their meaning); creation of new conducts; or withdrawal of conducts. It should be noted that withdrawal of conducts may occur for several reasons, including rewriting the behavior, integrating/combining it into another practice, dividing one conduct into several ones, or withdrawal because it is no longer relevant.

4.1.1 Obligations to Society

When analyzing the ACM’s code (ACM, 2018), all the three types of changes are noticed. The first is the creation of new conducts, such as “credit the creators of ideas, inventions, work, and artifacts,” “articulate, encourage acceptance of, and evaluate fulfillment of social responsibilities,” and “design and implement systems that are robustly and usably secure.” The opposite also occurred, i.e. the withdrawal of conducts, as it is in the case of “give credit for intellectual property,” which is now reflected in one of the new conducts created. Regarding the third type of change, for example, ACM has redefined the conduct “contribute to society and human wellbeing” (Oz, 1992) to “contribute to society and to human wellbeing, acknowledging that all people are stakeholders in computing” (ACM, 2018). Both conducts focus on the importance of contributing to society and human welfare. However, the most current version of the code presents conducts in a more detailed manner.

Concerning the CIPS’ code (CIPS, 2018), little has remained the same, and new behaviors have been added. Some examples are: “make efforts to notify all parties involved and to make full disclosure to the relevant authority if any conflict might be seen to occur by an independent 3rd party” and “not place personal interests or those of colleagues above interests of employers/clients, nor place any interests

above those of the public.” Changes have also been made to the wording of conducts, but without altering its meaning—for example, changing “obey laws of the country” (Oz, 1992) to “behave as directed regarding any other issue protected by legislation” or “carry out work or study ... in accordance with regulatory requirements and legislation” (CIPS, 2018).

Finally, the BCS (2021) code shows the same type of changes as the ACM’s code. For example, the conduct “have regard to the effect of systems on human rights” has been removed, and new conducts have been added, such as “avoid injuring others, their property, reputation, or employment by the false or malicious or negligent action or inaction.” Also, the conduct “ensure public good is not prejudiced while fulfilling obligations to employer and clients” (Oz, 1992) was changed to another with a similar meaning: “have due regard for public health, privacy, security and wellbeing of others and the environment” (BCS, 2021).

4.1.2 Obligations to Employer

Regarding the obligation towards the employer, in the ACM’s code (ACM, 2018), new behaviors have been added, mainly related to leaders, such as: “leaders should take care when modifying or retiring systems,” since these changes may put the employer and other entities at risk.

The greatest change in the BCS’ code (BCS, 2021) regarding this area was a modification in the designation of the obligation, which went from “employer” or “client” to “relevant authority,” an expression that encompasses both entities. Also, in relation to leaders and leading, there is a new conduct that stands out: “accept professional responsibility for your work and for the work of colleagues who are defined in a given context as working under your supervision.”

4.1.3 Obligations to Clients

In the CIPS’ code (CIPS, 2018), new conducts have been added, such as “meeting the requirements of the client,” and other conducts have been removed, such as “avail expertise.” In the old versions of the BCS’ code (BCS, 2021), the “obligations to the employer” were the same as the “obligations to the customer.” The same happens today, but under the designation of “relevant authority,” as already noted.

In the ACM’s code (ACM, 2018), the most visible change made was the withdrawal of one conduct which is now reflected in other conducts: “honor contracts, agreements, and assigned responsibilities.”

4.1.4 Obligations to Colleagues

According to Oz (1992), of the three codes studied here, in the early 1990s, only the CIPS’ presented conducts towards colleagues. However, in its current versions, all three codes include them. The ACM (2018) presents the conduct to “insist on and support the high-quality work from themselves and from colleagues.” The CIPS (2018) states to “support professional development for current and new CIPS members, for potential members, colleagues and subordinates,” and the BCS (2021) mentions to “act with integrity and respect in your professional relationships with all members of BCS and with members of other professions with whom you work in a professional capacity.”

4.1.5 Obligations to the Organization

Regarding the obligation to the professional organization or its members, the ACM’s code (ACM, 2018) remains the same. As far as the BCS’ code (BCS, 2021) is concerned, some of the conducts have been changed. For example, it excluded “strive to enhance public confidence in the profession” and added the conduct “uphold the reputation and good standing of BCS.” CIPS (2018), as already mentioned, has completely changed its code. In this obligation, 30 years ago, there was no specific related group of conducts.

4.1.6 Obligations to the Profession

Regarding the obligation towards the profession, essentially, there has been the development of new conduct. Thus, in the ACM (2018), the conduct “perform work only in areas of competence” was added. In the CIPS (2018), there were the conducts “maintain competence,” “maintain high personal standards,” and “give due credit to other people.” In the current BCS’ code (BCS, 2021), a specific group of obligations to the profession was created, including new conducts such as “do not claim any level of competence that you do not possess” or “seek, accept and offer honest criticisms of work.”

4.1.7 Summary

To sum up, in the last 30 years, much has changed in the codes of the studied organizations. There were changes in the structure of three codes, new conducts were created, and many others were revised, withdrawn, or merged. In some cases, the organizations (e.g., ICCP and DPMA) decided to discontinue their own codes and adopt other organizations' codes. Overall, the current codes are more detailed and include a higher number of conducts, which is reflected in the length of the documents. These are indicators that today there is a growing concern and awareness regarding IS professionals' expected behavior. Nonetheless, when comparing the codes, it becomes evident that there is space for improvement in each one of them, since there are important aspects that are addressed by some codes but not by the other codes (or at least not so thoroughly).

4.2 Recommendations for a Unified Code - Looking Back to Move Forward

In this section, we analyze whether Oz's (1992) recommendations are present in the current versions of the studied codes. Oz (1992) suggested six recommendations/principles that a unified code of ethics should contain, as presented in Table 3.

Recommendation/ principle	Brief description
1	The code should be organized along with constituencies to which the IS professional has obligations, i.e., the public, the employer, the client, the profession, and colleagues.
2	The obligations to the different constituencies should be a union of all of the obligations as detailed in the analyzed codes.
3	As the unified code is international, it should be free of obligations to any specific country.
4	Due to the inter-organizational nature of the code, obligations to professional organizations will be identical to obligations to the profession.
5	The code should provide general guidelines for priorities of obligations with respect to constituencies.
6	The code should detail the procedures for reporting and processing complaints against violators of the code and the measures taken against violators.

These six principles were divided here into two groups for a more structured analysis. The first group includes all the principles that can be verified in the current versions of the codes under study, namely the first, second, fifth, and sixth principles. In turn, the third and fourth principles are associated with the second group, which includes the conducts directed towards a unified code and, therefore, do not fit into the versions analyzed here, since they refer to particular codes of different entities (and not to a unified code).

The recommendations of the first group refer to aspects that should be taken into account in the structuring and development of any code. Regarding the first principle mentioned by Oz (1992), he states that the code should be organized “under the obligations towards the public, the employer, the client, the profession and colleagues.” In the early 1990s, only CIPS (2018) followed this structure. However, today, none of the codes are organized in this way, not even the CIPS' code (CIPS, 2018). Yet, both CIPS (2018) and BCS (2021) codes contain components of such organization. For example, in the BCS' code (BCS, 2021), one can be found in the sections “Duty to the Profession” or “Professional Competence and Integrity.” On the one hand, the structure originally proposed by Oz (1992) has significant advantages, since it is a way of organizing the conducts according to a hierarchy of priorities of constituencies (public, employer, etc.), and focusing on the constituencies may induce a better sense of responsibility. On the other hand, it may not be easy to do so, since some conducts are common/transversal to several constituencies, and therefore structuring the codes in that way may lead to redundancies of descriptions. Additionally, it may also disrupt the flow of the presentation and description of the behaviors.

Regarding the second principle, “the obligations to the different constituencies should be a union of all the obligations as detailed in the (analyzed) codes,” none of the current codes comply with it. Notwithstanding that the ACM's code (ACM, 2018) seems to be the most comprehensive of the three codes, there is still space for improvement in all of them. The extant codes of ethics and conduct (the ones analyzed in this paper and many more from other organizations) are the results of several decades of learning, reflection,

improvement, and work of organizations worldwide. These codes have many aspects in common, but there are also significant differences in structure, detail, and/or content. Even if it might be challenging to formulate a code resulting from the “union of all the obligations,” in the development of new codes (or in improving versions of existing codes) it is important to examine the codes of other organizations, to identify strengths and weaknesses, and thus learn and improve codes by adopting a benchmarking approach.

Another relevant aspect is the order of priorities, mentioned in the fifth principle. Oz (1992) suggests an order of priority: “the wellbeing of the general public, ahead of the interests of the client, employer, and colleague.” Of the versions of the codes studied by Oz, none considered this specific directive. However, the current version of the CIPS (2018) code mentions and describes this same order of priorities. In the work of an IS professional, it is not uncommon for dilemmas to arise that require a decision entailing ethical and conflicting implications—for instance, between society and the employer. Thus, the definition of a hierarchy of priorities would help when those situations come up.

The last point mentioned by Oz (1992) refers to sanctions. At the time, only the ACM (2018) code did not describe the procedure to be taken when a professional violated its code. In its current version, there is still no detailed information regarding sanctions. There should not be a need for sanctions, but since the world “is not perfect,” without sanctions and related procedures, when deviation situations arise, there is the risk of inaction or unbalanced penalties for the same misbehaviors.

For the second group, Oz (1992) states in the third principle that “the unified code should be exempt from obligations for any specific country,” and in the fourth principle, he states that “due to the inter-organizational nature of the code, obligations towards professional organizations are not necessary.” These two principles consider the existence of a unified and single code, which does not fit with the codes analyzed here, since they have been designed for particular organizations. As such, its verification is out of the scope of this work. Notwithstanding, when considering the possibility of a unified code, complying with the principles of the second group may be challenging due to local idiosyncrasies—for instance, related to some countries’ specific legislation.

Two main conclusions can be drawn. The first is that the recommendations suggested by Oz (1992) are not fully reflected in the current versions of the codes of ethics and conduct. The second is that, in general, these recommendations are valid contributions to the improvement of codes, and several still prevail (e.g., definition of the hierarchy of priorities) and are good support for the improvement of the codes.

4.3 The Need for a Unified Code of Ethics

Every IS professional should be committed to ethical conduct (Agresti, 2004). Given the importance of defining the ethical behavior of IS professionals, the first well-known code of ethics for the area of computing was developed by ACM in 1972, and it has already undergone several updates (ACM, 2018; Berleur & Brunstein, 1996).

However, “not all IS professionals are bound by the same set of rules” (Oz, 1992) since they do not belong to the same associations (e.g., ACM), and there is no law requiring their certification. For instance, nowadays, it is common to have projects carried out by multi-cultural teams comprised of members from different companies and countries who may belong to different professional organizations. These organizations may have their own codes of ethics, which may contain potentially conflicting conducts. Which should be the “correct” behavior of those team members when faced with the need to make a decision entailing ethical implications if these implications are addressed in different ways by their respective organizations’ codes? As far as we know, this is not currently addressed by the codes of ethics and conduct, thus raising the risk of ethical dilemmas.

The lack of a unified code of ethics or the obligation for all professionals to belong to the same organization means that the basic behaviors are not the same for all professionals, unlike the case, for example, of doctors, lawyers, or even psychologists, who are obliged to follow the same ethical conduct to exercise their profession.

The similarities in the three codes analyzed, from three countries (USA, Canada, and the United Kingdom), are many and outweigh the differences, as had already been verified in the work of Oz (1992), according to which “the differences cannot be attributed to organizational or national interests”; and “IS

professionals in their country do not differ from their colleagues in other countries, and all must meet the same standards of practice, regardless of organizational or national affiliation.”

Furthermore, “the relationship between IS professionals and the public is similar to most other professional relationships in terms of knowledge and trust, such as, for example, the doctor with his patient” (Oz, 1993). Therefore, it is important for representatives of a profession to follow a code of ethics despite their professional organization.

In recent years, many other codes have been published and updated, such as the codes from ACS (2021), AICA (2015), IEEE (2018), ITPNZ (2017), among others, mainly because technological and societal changes raise new ethical questions. However, there are still differences and gaps in the codes, and none of them represents a “superset” (union) of conducts—or, in other words, a unified code.

More and more IS professionals around the world are increasingly connected. In addition, within the same professional category, professionals use similar skills, which helps overcome the obstacles to the definition of a unified code of ethics (Oz, 1993).

Given these considerations, the importance of a “shared and coherent” code of ethics remains. However, this does not necessarily imply the existence of a “single” and “universal” code, but rather the definition of a set of common and shared standards of ethical conduct, which all codes should address.

To note that many organizations, including the Association for Information Systems (AIS, 2019) and the International Federation for Information Processing (IFIP, 2021), have currently largely adopted ACM’s Code of Conduct (ACM, 2018). This may be suggesting that there are movements towards unifying codes by reusing well-established codes when they meet the organizations’ needs.

5 Conclusion

Dennis and Stockall (2015) state that a replication study brings five important benefits to the field of IS. One of these benefits is present in this paper, which is the “validation of papers published in other periods.” In addition to revisiting the theme of the original paper, this replication shows that there are still aspects to be improved in the codes of ethics, even considering that the codes under study are current and updated versions.

In other words, this research has shown that although thirty years have passed since Oz’s (1992) study, there is still room for improvement in this area concerning the principles, structure, and set of conducts of the codes. Taking the ACM’s code (ACM, 2018) as an example, even considering that it is one of the most comprehensive codes, it would be important to provide general guidelines regarding the priority of obligations towards constituencies in the event of a conflict of interest. The description of the process of ethical decision-making, such as can be found in the CIPS (2018) code, would also be another valuable element. We can find similar examples in all three codes under study.

The codes of ethics and conduct originally selected by Oz (1992) are the same as those discussed in this work, which is a limitation of this paper since several other organizations also have codes of ethics (notwithstanding sharing the same objectives).

Considering the importance of codes of ethics and conduct for IS professionals, future studies should conduct thorough research of existing codes to identify weaknesses and opportunities for improvement. It would also be useful to have a framework that could be followed by entities when developing their codes; the existence of a common framework would help reflect on how to improve existing codes and could serve as a basis for the creation of new codes. It could also help define a set of common and shared standards of ethical conduct, which all codes should address.

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