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Ethics and Deontology in Information Systems – Evolution of Professional Codes

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Abstract

Information Systems professionals deal daily with ethical dilemmas, which are most notorious when making decisions. Due to the importance of ethical behavior and to prevent unethical situations without full awareness of them, the development of codes of ethics and conduct for companies and communities of professionals has been fundamental. Since the creation of the first code of ethics in computing in 1972, many codes of ethics and conduct have emerged from the initiative of various societies, organizations, and associations all over the world. This article identifies and describes the structural evolution of the main codes in the Information Systems area, from the original to the most recent versions. From analyzing the codes, the following results were obtained: (1) codes of ethics and codes of conduct are the most common code types; (2) the codes are directed mainly at all members of the entities (without differentiation); (3) the evolution of codes is related to the changing of descriptions of conducts, the changing of the structure of documents, and in many cases there is an increase of the number of conducts of ethical behavior in the newer versions of the codes.

Keywords: Ethics; Deontology; Code of Ethics; Information Systems.

1. INTRODUCTION

"The future of computing depends on both technical and ethical excellence" (ACM, 2018). Ethics helps us understand how we should live in society, being the nature of right and wrong, good and evil, thus directly linked to deontology, a discipline of ethics focused on the performance of a profession. Deontology is the branch of ethics that deals with the foundations of duty and moral norms (Paletta & Silva, 2017).

Ethics has long become an essential component of the global Information Systems (IS) agenda. Technological advances increasingly mark our society and bring unique ethical challenges (Ribeiro & Varajão, 2022). Organizations must focus on disseminating and customizing effective mechanisms to prevent or minimize unethical behavior within their IS professional teams (Munro & Cohen, 2004; Cavalcante & Varajão, 2021). However, this need for reflection on ethical behavior among IS professionals is already "old". It has been recognized since the 1970s and 1980s, with the dawn of information technology (IT) and the emergence of new ethical dilemmas (Stahl, 2012).

Given the importance of defining the ethical behavior of IS professionals, the first widely known code of ethics for the area of computing was developed in 1972 by the Association for Computing Machinery (ACM). Over the years, other areas related to computing have emerged, and with it, organizations, associations, and societies have been created worldwide. These organizations' different characteristics, principles, and focus have led many to develop their codes so that associate members can follow them. In turn, organizations have presented several versions of their codes over the years. On the one hand, they provide a rich perspective of the behaviors to be followed by professionals. On the other hand, it is challenging to obtain a comprehensive and coherent view of these same conducts and ethically acceptable attitudes.

The aim of this article is to identify, list, and analyze the structural evolution of currently existing codes of ethics, codes of conduct, codes of practice, among others, made available by different organizations, associations, and societies. A literature review and an analysis of the codes identified were carried out to provide a broad perspective of the codes and to enable an understanding of their evolution, differences, and similarities regarding structural characteristics.

The present work continues as follows. Fundamental concepts are described in section 2. Section 3 describes the method used to carry out the work. Section 4 presents the results. In section 5, the results are discussed. Conclusions, limitations, and opportunities for future research are presented in Section 6.

2. FUNDAMENTAL CONCEPTS

2.1. Ethics

The term "ethics" has its origin in the Greek "ethos", which means "habit", "customs", "character" (Fabris, 2018; Leiva, Guevara, & Caro, 2010; Yadiati & Meiryani, 2019) and "deliberate personal behavior" (Puech, 2016). Ethics is the branch of philosophy that means, according to Le Marec (2007), "way of life", and that studies what is morally right or wrong, examining the rational justification of our choices and moral values. Marra (2003) states that ethics studies the concepts that delimit human actions regarding what is appropriate or right and what is improper or wrong. It also adds that those who study ethics analyze and define the concepts of right and wrong. Leiva et al. (2010) complement this idea by stating that ethics is the science of moral behavior.

Several authors report that ethics drives human behavior. They define ethics as a set of beliefs, standards, conventions, or examples of guidelines that surround an individual or a society (Schuelke-Leech, Leech, Barry, & Jordan-Mattingly, 2018; Yadiati & Meiryani, 2019). In turn, Payne and Landry (2006) state that ethics is related to correct and fair conduct or behavior.

According to Leiva et al. (2010), ethics aims to create principles that help human beings question things for themselves and study morality and their actions. One must apply reasoning to learn to be

ethical (Marra, 2003). In short, ethics discusses good and bad, values and moral judgments, and is linked to the foundation of morality. "Ethics is a social issue concerning people's obligations to others. It is a set of expectations shared among themselves and with the world" (Karlsson, 2003; Taylor & Moynihan, 2002). "Thus, ethics includes the responsibility to recognize the knowledge that, as professionals, we have and should use for the benefit of society as a whole" (Riedesel, Manley, Poser, & Deogun, 2009).

2.2. *Deontology*

The term "deontology" has assumed different meanings throughout the history of ethics. The word "deontology" comes from the Greek "δέον" (Deon, "duty, obligation") + "λόγος" (logos, "science") (Le Marec, 2007; Paletta & Silva, 2017).

Fabris (2018) refers to "deontology" as a set of duties that must be respected by those exercising a specific profession. Deontology aims to establish the limits of educational and communicative activity by indicating particular regulations and prohibitions. The term "deontology", as referred to by Fabris (2018), prescribes obedience to duty, regardless of the consequences resulting from its implementation. In other words, the fundamental question is about responsibilities and moral obligations (Puech, 2016).

According to Walsham (1996), deontology, in principle, provides "a set of rules to answer the fundamental question of 'How should I live?'" Fabris (2018) adds that deontology makes it possible to understand better what "doing well" means when operating in some professional areas and, more generally, when technical tools or technological devices are used. In short, deontology is "the domain of doing and how to do it" (Le Marec, 2007).

3. METHOD

A literature review was carried out aiming to identify and analyze IS professionals' codes of ethics and conduct. A literature review aims to summarize the state of the art of the subject under study. Analyzing works makes it possible to characterize what exists and identify limitations and themes to form future research (Rowley & Slack, 2004).

The search strategy initially involved (1) identifying data sources, (2) identifying search expressions, and finally, (3) defining the method to be used in selecting documents. It should be noted that the results of the research on the themes of "ethics" and "deontology" were vast; however, when restricted to the area of IS, the results decreased significantly.

The sources chosen were Scopus, Web of Science, and AIS eLibrary, as these are important aggregators and include the leading outlets of information in the area (considering scientific journals and conference proceedings). The expressions used were the following: "ethic*"; "deontology";

"information system*"; "information techonolog*". To aggregate these expressions, the logical operators "OR" and "AND" have been added. The search resulted in: Scopus - 1188 articles; Web of Science - 114 articles; and AIS eLibrary - 75 articles.

With the results of the research, the first selection of articles was made based on the title, keywords, and abstract. The articles excluded in this first filtering were articles in which the abstract did not focus on aspects related to ethics or deontology in IS or IT. After the initial filtering, 147, 33, and 11 articles resulted, respectively. A partial reading of the selected articles was then done in order to identify the relevant publications for this work. This filtering focused on aspects related to ethics or deontology in IS or IT that would represent a value by portraying topics related to this study.

The final results obtained in the three search engines were 33 articles from Scopus, 12 from Web of Science, and nine from AIS eLibrary, corresponding to 54 publications (without repeated references). From these references, two more were identified. The identified codes were obtained from the original sources based on the results. Then, each code was analyzed in detail, characterized in terms of the publishing year, type of code (for example, code of ethics or code of conduct), and the area of coverage and target (to whom they are directed). A bibliometric analysis was also carried out, focusing, for example, on the number of sections or number of conducts considered by each code. The analysis in scientific databases was mainly intended to obtain and/or understand whether codes of ethics and conduct had been the subject of research.

4. RESULTS

The review made it possible to identify a wide range of documents classified as "codes of ethics", "conduct", "practice", "ethics and conduct", "ethics and standards of conduct", "standards of conduct", "ethical guidelines", "ethical principles", and others, coming from various organizations, societies or associations.

Regardless of the organization or the type of code, the behaviors identified should not be taken as absolute truth, but as guides to making better decisions since, in the end, each one is responsible for the choices made (TIVIA, 2014). Despite this rule of "common sense", the existence, appreciation, and use of codes are fundamental since they indicate conduct and behavior accepted as "correct".

Codes of ethics and conduct materialize concerns about ethics, together conveying values to all professionals in the corresponding field and impacting their behavior by providing conscious guidance (Collins, 2012). It should be noted that there are differences between the various types of existing codes. However, the most important differentiation concerns codes of ethics, codes of conduct, and codes of practice.

According to Collins (2012), a code of ethics expresses the principles that define the moral essence (of an organization) and should be easy to interpret. An example of a code of ethics is the IEEE

Advancing Technology for Humanity (2014), which presents ten ethical behaviors. In turn, a code of conduct expands the moral principles of a code of ethics. For example, the ACM Code of Ethics and Professional Conduct's (ACM, 2018) principle "Accept and provide an appropriate professional review" is clarified/developed in the code as "High-quality professional work in computing depends on professional review at all stages. Whenever appropriate, computing professionals should seek and utilize peer and stakeholder reviews. Computing professionals should also provide constructive, critical reviews of others' work". Codes of practice should not be confused with others as they have specific characteristics. A code of practice is used as guidance for individual decision-making. Generally speaking, it "indicates how things are done generally, or in a given situation" (Birkett & Barbera, 1999). For example, the BCS Code of Practice has two levels. The first includes "short statements setting out the elements in practice to be observed", and the second includes "the rationale for level one statements" (Berleur & Brunnstein, 1996). One example of a level one statement is "Ensure subordinates are trained in order to be effective in their duties and to qualify for increased responsibilities", which corresponds to the level two statement, "Take action to ensure that your hard-won knowledge and experience are passed on in such a way that those who receive them not only improve their effectiveness in their present positions but also become keen to advance their careers and take on additional responsibilities" (Berleur & Brunnstein, 1996).

The literature review identified 44 organizations, associations, and societies, their respective codes, and the year of their creation or updating. These 44 entities can be organized into three groups. The first concerns entities belonging to the International Federation for Information Processing (IFIP), a worldwide organization that acts as an umbrella of national computer science/informatics societies. The second group includes members associated with the IFIP representing a continent. Finally, the third group is made up of all the other companies that do not fit into the first two groups. Table 1 identifies the codes that result from the search made.

Based on the codes identified in Table 1, Figure 1 presents a timeline representing the last 50 years, showing the documents' creation and updating dates. It can be seen that the first code appeared in 1972, and new codes were updated or created until the year 2019 (when our search was carried out). Some of the codes presented have not been analyzed as they are not publicly available. It should be noted that for some codes, it was not possible to obtain the year in which it was published and are therefore not represented in the figure. Nevertheless, they were subject to analysis like the others.

The different colors in Figure 1 indicate the change of the century. The entities are in alphabetical order, with the primary objective of facilitating the identification of those entities that, over the years, have reviewed or changed their codes. In the case of codes in which it was not possible to determine the year, a request was sent via email to each corresponding entity to obtain that same information. However, only the ICCP responded (but without specifying the year its code was created).

	ORGANIZATIONS	YEAR	CODE TYPE	TARGET	REFERENCE
Members of the National IFIP Society	Association for Computing Machinery (ACM)	1972	Code of Conduct	All members	(Berleur & Brunnstein, 1996)
		1992	Code of Ethics and Conduct	All members	(Berleur & Brunnstein, 1996)
		2018	Code of Ethics and Conduct	All members	(ACM, 2018)
	Australian Computer Society (ACS)	1993	Code of Ethics	Professional members	(Berleur & Brunnstein, 1996)
		2014	Code of Ethics	All members	(ACS, 2016)
		2014	Code of Conduct	All members	(ACS, 2016)
	Associazione Italiana per l'Informatica e il Calcolo Automatico (AICA)	1993	Code of Conduct	All members	(Berleur & Brunnstein, 1996)
		2015	Code of Conduct	Professional members	(AICA, 2016)
		2015	Code of Ethics	Professional members	(AICA, 2016)
	British Computer Society (BCS)	1978	Code of Practice	Professional members	(Berleur & Brunnstein, 1996)
		1984	Code of Conduct	Professional members	(Berleur & Brunnstein, 1996)
		1992	Code of Conduct	All members	(Berleur & Brunnstein, 1996)
		2015	Code of Conduct	All members	(BCS, 2015)
		2019	Code of Conduct	All members	(BCS, 2019)
	Canadian Information Processing Society (CIPS)	1985	Code of Ethics and Conduct	All members	(Berleur & Brunnstein, 1996)
		2005	Code of Ethics and Conduct	All members	(CIPS, 2005)
		2018	Code of Ethics and Conduct	All members	(CIPS, 2018)
	Computer Society of India (CSI)	1993	Code of Ethics	All members	(Berleur & Brunnstein, 1996)
		NA	Code of Ethics	All members	(CSI, 2018/2019)
	Institute of Information Technology Professionals South Africa (IITPSA)	1988	Code of Conduct	Professional members	(Berleur & Brunnstein, 1996)
		1988	Code of Practice	Professional members	(Berleur & Brunnstein, 1996)
		NA	Code of Conduct	All members	(IITPSA Institute of Information Technology Professionals South Africa, NA-a)
		NA	Code of Practice	Professional members	(IITPSA Institute of Information Technology Professionals South Africa, NA-a)
		NA	Ethical Principles	All members	(IITPSA Institute of Information Technology Professionals South Africa, NA-b)
	The Computer Society of Zimbabwe (CSZ)	1992	Code of Conduct	For registered consultants	(Berleur & Brunnstein, 1996)
	Gesellschaft fiir Informatik (GI)	1994	Ethical Principles	All members	(Berleur & Brunnstein, 1996)
	Irish Computer Society (ICS)	1994	Code of Conduct	Professional members	(Berleur & Brunnstein, 1996)
	Institute of Electrical and Electronics Professionals (IEEE)	1990	Code of Ethics	All members	(Berleur & Brunnstein, 1996)
		2014	Code of Conduct	All members	(IEEE Advancing Technology for Humanity, 2014)
		2018	Code of Ethics	All members	(IEEE, 2018)
	IT Professionals New Zealand (ITPNZ)	1978	Code of Ethics and Conduct	All members	(Berleur & Brunnstein, 1996)
		2017	Code of Ethics	All members	(ITPNZ, 2017)
	Singapore Computer Society (SCS)	1990	Code of Conduct	All members	(Berleur & Brunnstein, 1996)
		NA	Code of Conduct	All members	(SCS, NA)
	Sociedade Brasileira de Computação (SBC)	2013	Code of Ethics	Professional members	(Sociedade Brasileira de Computação, 2013)
	Finnish Information Processing Association (TIVIA)	2014	Code of Ethics	Professional members	(TIVIA, 2014)
	Information Processing Society of Japan (IPSJ)	1996	Code of Ethics	All members	(Berleur & Brunnstein, 1996)
	Order of Engineers	2006	Code of Ethics and Deontology	Professional members	(Portuguese Order of Engineers, 2006)
	Computer Society of Sri Lanka (CSSL)	NA	Code of Ethics	All members	(CSSL Computer Society of Sri Lanka, NA)
		NA	Code of Conduct	All members	(CSSL Computer Society of Sri Lanka, NA)

	ORGANIZATIONS	YEAR	CODE TYPE	TARGET	REFERENCE
	Schweizer Informatik Gesellschaft SI (SIGSI)	2019	Code of Ethics	Professional members	(SI, 2019)
Other Continental Societies	Council of European Professional Informatics Societies (CEPIS)	1992	Code of Conduct	Professional members	(Berleur & Brunnstein, 1996)
		1999	Code of Conduct	Professional members	(Bertrán & Llobet, 1999)
	South East Asia Regional Computer Confederation (SEARCC)	1993	Code of Ethics	All members	(Berleur & Brunnstein, 1996)
Other Societies	Slovensko društvo Informatika (SDI)	2010	Code of Ethics	All members	(Slovenskega Društva Informatika, 2010)
	American Society for Information Science (ASIS)	1992	Code of Ethics	All members	(Berleur & Brunnstein, 1996)
	Association of Independent Information Professionals (AIIP)	2002	Code of Practice	All members	(AIIP, 2002)
	Association of Software Professionals (ASP)	NA	Code of Conduct	All members	(Association of Software Professionals, NA)
	Building Industry Consulting Service International (BICSI)	NA	Code of Ethics	All members	(BICSI, NA)
		NA	Standards of Conduct	All members	(BICSI, NA)
	Geospatial Information & Technology Association (GITA)	2009	Code of Ethics	All members	(GITA, 2009)
	Information Systems Security Association (ISSA)	2007	Code of Ethics	All members	(ISSA International, 2007)
	International Web Association (IWA)	NA	Code of Ethics	As head of the profession	(International Web Association, NA)
	Network Professional Association (NPA)	2007	Code of Ethics	Professional members	(NPA Network Professional Association, 2007)
	Colegio de Profesionales en Informática y Computacion (CPIC)	2013	Code of Ethics	Professional members	(CPIC, 2017)
	Hong Kong Computer Society (HKCS)	NA	Code of Ethics and Conduct	All members	(HKCS, NA)
	Institute for Certification of Computing (ICCP)	2018	Code of Ethics and Conduct	Professional members	(ICCP, 2018)
		NA	Code of Ethics	Professional members	(ICCP, NA)
	Institute for the Management of Information Systems (IMIS)	NA	Fundamental Principles	All members	(IMIS, NA)
	Software Engineering Ethics and Professional Practices (SEEPP)	1999	Code of Ethics and Practice	Professional members	(SEEPP, 1999)
	Data Processing Management Association (DPMA)	NA	Code of Ethics	For individuals: as administrator, member and professional	(Oz, 1993)
		NA	Standards of Conduct	For individuals: as administrator, member and professional	(Oz, 1993)
	Information Techonology Association of America (ITAA)	NA	Ethical Principles	All professional service companies and their employees	(Oz, 1993)
	Colegio de Ingenieros del Perú (CIP)	1999	Code of Ethics	Professional members	(ECC, 1999)
	Association Information Systems (AIS)	2015	Code of Conduct	Professional members	(AIS, 2015)
	Computer Professionals for Social Responsibility (CPSR)	1973	Code of Practice	All members	(Berleur & Brunnstein, 1996)
	Information Processing Professionals Association of Korea (IPAK)	1994	Code of Ethics	All members	(Berleur & Brunnstein, 1996)
	Information Processing Professionals Association of Korea (IPAK)	1994	Standards of Conduct	All members	(Berleur & Brunnstein, 1996)
	Japan Information Service Industry Association (JISA)	1993	Code of Ethics and Conduct	All members	(Berleur & Brunnstein, 1996)
	Vereniging van Registerinformatici (VRI)	1993	Code of Ethics	To be recognized as RIS (Registered Information Scientists)	(Berleur & Brunnstein, 1996)
	Centro de la Informatica, Telematica y Medios Afines (CITEMA)	1994	Deontology Standards	Professional members	(Berleur & Brunnstein, 1996)

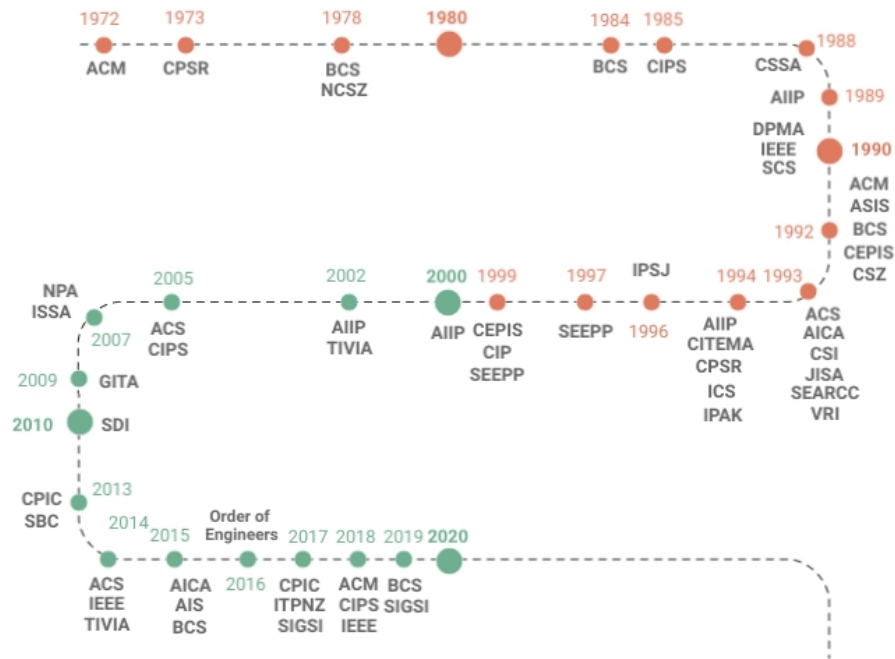Table 1 – Identified Codes
Legend: NA- Not Available

Figure 1 – Timeline of codes' evolution

An updated version of the list of codes can be found at https://sites.google.com/view/codesethics

5. DISCUSSION

The following types of codes were found in the literature: "Code of Ethics"; "Code of Conduct"; "Code of Practice"; "Standards of Conduct"; "Code of Ethics and Standards of Conduct"; "Ethical Guidelines"; "Ethical Principles" and others. Most of the codes analyzed (38%) fall into the "Codes of Ethics" category, followed by the "Codes of Conduct" (28%). "Code of Ethics and Conduct" also shows a significant percentage (10%). The regions with more codes, and therefore the most prominent, are: United States of America (16), United Kingdom (2), South Africa (2), Japan (2), and Southeast Asia (2).

Most codes are directed to "All Members" of the institutions (63%). This category includes all types of members, who can be students, professionals, workers of specific areas, or even employees of the institution. With 28%, there is the category "Professional Members", representing the codes that are only directed to professional members in the IT area.

It should be noted that when directed at "All Members", codes present more general conducts for "anyone using the technology" to guide themselves (ACM, 2018). There are also conducts directed at members who currently exercise the profession. Codes directed to "Professional Members" present behaviors focused on the practice of IT professionals.

Looking mainly for structural changes in the different versions of codes, were analyzed several aspects: (1) Change of the name of the organization; (2) Change of the title of the code; (3) Change of code type; (4) Change of target public; (5) Change of structure; (6) Change of descriptions; (7) Increase in the number of conducts; (8) Increase the number of pages; (9) Change of authorship; (10) Change of country of origin; (11) Change of language; (12) Creation of a new code. Table 2 shows the main changes identified in the codes.

	From	To	Creation of a new code?	Change of language?	Change of country of rearing?	Change of authorship?	Increase in the number of pages?	Increase in the number of conducts?	Change of descriptions?	Change of structure?	Change of target public?	Change of code type?	Change of the title of the code?	Change of the name of the organization?
ACM	1972	1992				X	X	X	X	X		X	X	
	1992	2018				X	NA	X	X	X	X			
ACS	1993	2014				X	NA	X	X	X	X		X	
AICA	1993	2015	X			X	NA	X	X	X	X	X	X	
BCS	1978	1984	X	NA	NA	NI	NA	NA	NA	NA		X	NA	
	1984	1992				X		X	X	X				
	1992	2015				NA	NA	X	X	X	X			
	2015	2019							X	X				
CEPIS	1992	1999			NI	NI	NA	X	X		X			
CIPS	1985	2005				NI		X	X	X		X	X	
	2005	2018				NI	X	X	X	X		X	X	
CSI	1993	ND				NI			X	X				
IITPSA	1988	ND				NI	NA	X	X	X	X		X	X
IEEE	1990	2014	X	NA	NA	NI	NA	NA	NA	NA	X	X	NA	
	1990	2018				NI	NA		X					
ITPNZ	1978	2017				NI	NA	X	X	X		X	X	X
SCS	1990	ND				NI	NA		X				X	

Table 2 – Changes in codes
Legend: X- Occurred; NA- Not Applicable; NI- No Information; ND- Not Available

In many cases, there was a change of structure, which occurred in twelve codes. These changes occurred mainly in two aspects. First, there was a change of sections. For example, in the BCS code of 1992, there is the section "Duty to Employers and Clients", which aggregates several conducts; however, it no longer exists in the 2015 code. The second aspect concerns changes in the conducts, such as in the ACS code of ethics, "I will work competently and diligently for my clients and employers", which was changed to "You will strive to enhance the quality of life of those affected by your work".

The "Change of descriptions" was something that occurred in all codes except for the two codes where this is not applicable. As an example of this amendment, it can be noted that in the AICA

code, "A constant personal engagement in keeping updated on the developments of informatics in the fields that are more directly connected to his activity", was changed to "Professional Members are required to conduct their business diligently and work to increase public understanding of Digital Sciences and Technologies and their implications". Continuing with the example of the AICA code, regarding the increase in the number of conducts, the 1993 code of ethics presented seven conducts, which became thirteen in the 2015 version.

The aspects mentioned so far have been the most frequent. However, there are other aspects to note, such as "Change of the title of the code", "Change of code type", and "Change of target public". The first relates to the title of the code, which changed in eight cases. An example of this change is the ACM code that in 1972 was entitled "ACM Code of Professional Conduct and Procedures for Enforcement" and, in 1992, turned out to be "ACM Code of Ethics and Professional Conduct".

The "Change of code type" occurred in seven cases. It is the case of CIPS, for example, which introduced the "Code of Ethics and Standards of Conduct" in 1985 and, in 2015, the code was entitled "Code of Ethics and Professional Conduct", thus changing its type.

The "Change of target public" was verified in seven codes. This change occurred, for example, in the ACS code; in 1993, it was directed to "all professional member workers" and, in 2014, the code became directed to "all members of ACS, regardless of their function or specific area of expertise".

The "Change the name of the organization" occurred in only two cases, IITPSA and ITPNZ. In 1988, IITPSA was Computer Society of South Africa (CSSA), and in 1978, ITPNZ was renamed to New Zealand Computer Society (NZCS).

Finally, the "Change of authorship", "Change of country of origin", "Change of language", and "Creation of a new code" occurred only occasionally. In some cases, the comparison was not possible due to the change of the code type, which is the case, for instance, of the BCS code: in 1978, the BCS' code type was "ethics", and in 1984, it was changed to "code of conduct". The same happened in the case of the IEEE code.

A brief quantitative analysis of the codes is presented in Table 3. The columns show the latest version of each of the codes, and some metrics are in the rows.

	ACM 2018	ACS 2016	AICA 2016	BCS 2019	CEPIS 1999	CIPS 2018	CSI (NA)	IITPSSA (NA)	IEEE 2018	ITPNZ 2017	SCS (NA)
Number of sections	4	6	0	4	4	4	5	6	0	0	4
Number of conducts	25	38	13	22	17	20	20	26	10	8	15
Number of words	4242	1746	656	1349	628	2916	479	1734	409	4224	333
Number of pages	10	8	3	6	1	7	1	3	2	18	1

Table 3 – Quantitative analysis of codes
Legend: NA- Not Available

This table, although simple, is useful as it allows us to realize significant differences in the codes in terms of structure (ranging from zero to six sections), the number of conducts (ranging from 8 to 38), and detail (ranging from 333 to 4 242 words).

6. CONCLUSION

"Review papers become essential tools for summarizing or synthesizing the extant literature in all applied fields" (Templier & Paré, 2015). This article provides a comprehensive overview of the different codes in the IS area. We analyzed seventy-one codes from forty-four entities. After analyzing the codes, the following conclusions were reached: many codes have their origin in the United States of America; codes of ethics and codes of conduct are the most common types; the codes are directed mainly at all members of the entities, without differentiation; the evolution of codes takes place in the changing of descriptions of conducts, in the altering of the structure of documents, and in the increase of the number of conducts of ethical behavior. Regarding the number of sections, the ACS (2016) code, together with IITPSA - Institute of Information Technology Professionals South Africa (NA-b), shows a higher number of sections (six). The ACS (2016)'s code has a higher number of conducts (38). The code of ACM (2018) has 25 conducts and a higher number of words (4242). The ITPNZ (2017) also has a considerable length (4224 words) and a higher number of pages (18). It should be noted that the number of words, and therefore the number of pages, has been increasing since recent codes are more extensive than those of the past.

The study's main contributions include the compilation of various codes of organizations, societies, and associations, along with their milestones and structural analysis. However, the codes analyzed do not represent the totality of existing codes in the IS area, as some codes could not be accessed because they are not publicly available.

Despite this limitation, as far as we know, this article provides a detailed list of codes and main characteristics for the first time, providing a basis for future research work. For professionals, it gives important insights to identify the various relevant codes according to different entities and to whom they are specifically directed. For future work, conducting a content analysis of the codes is suggested to determine if they are aligned concerning the conducts and if they cover the ethical challenges of emergent technologies (e.g., related to artificial intelligence) well. Furthermore, this study should be replicated/updated periodically.

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