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Codes of Ethics Within IFIP and Other Computer Societies¹

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1. ETHICS, LAW AND CODES: THEIR RESPECTIVE ROLES IN THE REGULATION OF INFORMATION PROCESSING

Creating 'spaces for discussion' on ethical issues in computing appears as one of the main tasks of an international association like IFIP. Advances in computer technology in recent years and their spread throughout the whole of society have created new dilemmas which put forward the need for improving the role of the Computer Societies, of re-evaluating the practice of the computer science profession, of including ethical considerations in computer scientists' curricula, and - why not ? - of teaching children the ABCs of computer ethics²

But these spaces for discussion are not relying on a vacuum. States have been governing some aspects, and principles are already established related to specific matters: over the last twenty years, some twenty-seven countries have adopted a legislation, mainly if not exclusively on personal data protection. Some companies or computer manufacturers (Fujitsu, IBM, etc.) are progressively laying down self-regulation or already have their own codes of conduct or similar guidelines³. There are also claims for 'A Bill of rights for Electronic Citizens'⁴. Some IFIP national Societies have a Code of Ethics or of Conduct, and some of them recently reviewed it, like BCS (British Computer Society), ACM (Association for Computing Machinery), while others have written their first one, like CSI (Computer Society of India), Irish Computer Society (CSI) and GI (Gesellschaft für Informatik). The Council of

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Europe has been working on the specific subject of 'legal problems connected with the ethics of data processing' for three years (1979-1982) without adopting a final resolution other than suggesting to explore some more sensitive fields such as health care, social security, police, employment, etc.⁵ We shall come back to this subject later. Let us also remind ourselves that the Committee of Ministers of the same Council of Europe is at the origin of the so-called Convention n° 108, which has inspired so many legislations⁶. Twenty countries have signed and fifteen ratified the Convention n°108, at the date of September 2nd, 1993⁷. The work of OECD should also be mentioned because it has influenced so many national and international computer policies⁸.

The purpose of this essay is neither to summarize this proliferation of literature, and subsequent action, nor to derive basic principles which would clarify how to deal with applied ethics in the field of computer science and practices. Our aim is more modest. We would merely point out some questions that require care when dealing with Codes of Ethics/Conduct/Practice. Our main contribution will focus on such Codes and their analysis. But in order to make recommendations which could fit with different contexts, one must be aware of major distinctions which have appeared in the last decades. We are here referring to the three terms which appear in the title of this part: Ethics, Law, and Codes.

What can be stressed is that we are facing a confused terrain: on the one side, for instance, the content of some 'Codes of Ethics' is similar to the content of what others have named 'Codes of Conduct'. On the other, the specific computing issues, such as privacy, is better treated in law than in codes. What are the respective roles of ethics, law and the codes? We will now try to clarify these.

Ethics

Can ethics be defined unambiguously? As pointed out in the paper of Jan Holvast⁹, there are ethical schools and traditions which provide different answers to questions such as: 'When is an action to be called morally right?', 'What is the essence of moral judgments?', 'What is the attitude to the freedom of moral decisions?'¹⁰

As it will appear later, the label 'Code of Ethics' sometimes refers to the same content than other codes which are labelled 'Codes of Conduct', reducing ethics to professional rules. Or, on the other side, ethics is defined in such inspirational terms that no enforcement rules seem to be applicable.

Traditionally, ethics is defined as including at least a set of principles of judgment and action which imposes itself upon individual conscience and collective consensus as founded on the imperatives of 'the good'. This view of ethics may raise many difficulties, since it refers to a judgment which is itself founded on the references to an objective knowledge of the moral law as perceived by reason, and to the subjective conscience of the moral norm.

Moreover, ethics, as it refers to an action to be achieved and the goodness of that action, includes an idea of values which differ socially, as well as culturally. Values are always a system of values which cannot be understood out of the context of elaboration. Any ethical decision is taken in a personal and social context which is the expression of a culture and of a

specific social way of living. In turn, any ethical decision has always a feedback on the identity of its social setting.

We must add that, for those who are insisting on the individual character of ethics - without denying its social and cultural dimensions -, the particularity of ethics - its social and cultural differences - could bias the view at specific rules as adopted here and there so that what is viewed here as good could appear as bad elsewhere.

Without departing from the different trends, let us stress at least one conclusion and one orientation.

The conclusion is that, at least at the present time, an international agreement on ethics, and hence an international code, is unachievable. IFIP has already experienced the problems.

The orientation would be to share what is interesting in the emergence of new attitudes towards ethics. We shall come back later to the question of 'the motivation for a revival of ethics', but we should stress here the positive aspects of what appears to be the opening of applied ethics in the computing field.

For a long time there has been a traditional distinction between 'individual ethics' and 'social ethics' which gave the opportunity of raising questions about collective practices and of a good exploration of the way of living the social dimension of our existence. Social ethics was an appropriate concept for criticizing the collective practices in order to maximize the share of liberties in the social space. What appears today is that this distinction cannot take into account the fact that all the dimensions of life - social, cultural, sexual, spiritual - interact.

The main challenge that applied ethics has to face is the realization of what we could call a return to the ethics of daily life, a re-appropriation of our own responsibility in all the dimensions of our life, whether they be individual or social. This ethics is influenced by the world of pragmatics as it is predominant in the scientific practice. We are not looking for an ideal-type of society, but for a method of analysis and a self-determination towards an achievable and sustainable social future - which excludes total relativism¹¹.

The recent creation of specific applied ethics Centres - as for biomedical and biotechnological questions - reveals the emphasis on methodological approach. We could say that we are now opening the scientific and technological 'blackboxes'. But the decisive question will be to apply in the social field the results of such an approach.

The analogy with Information and Communication Technology (ICT) could be obvious if we consider the work which has been done in the field of ICT Assessment. The way is open for an ethics committed to a strategic rationality which evaluates the social forces in presence, their bargaining power, and the possibility of a common exercise of social responsibility.

Law

More than twenty years of efforts in legal regulation have revealed principles which can be considered today as stable, at least in Western Europe. These laws - from the first one in Sweden (1973) to one of the latest in Belgium (1992) - concentrated on the protection of individual data in the manual or computerized processes, and the transfer to 'third' including transborder data flow. They have consecrated the right of access for the person whose

personal data are processed and the right for data collecting, storing and processing by public and private organizations.

The Convention n° 108 of the Council of Europe has surely been guiding most of the legislators¹², and the annual meetings of the Data Protection Commissioners have been helpful in specifying the accepted principles. The active presence and participation of OECD in these meetings has also re-enforced the relative homogeneity of what is included in most of the legislations. These meetings are 'informal' and are not normative. On the other hand, the Convention is compulsory for those Countries which have ratified it, but it only expresses principles to be included according to the legal context of each country. The situation is the same for the European countries with the European Directive in preparation¹³.

Let us try to summarize the above two mentioned rights: the rights of the person whose data are registered and the rights of the organizations who collect, store and process those data¹⁴. Most of the French commentators speak about, respectively, the 'filed' and the 'filer'.

On the side of the registered people (the 'filed'), the foundation of data protection legislation is the human freedom and dignity. The laws allow specific subjective rights to the individuals for exercising their rights to auto-determination. These rights can be summarized in what is now recognized as the 'access right'. But these rights to auto-determination are confronted by other liberties, other interests, and, namely, the general and common interest. It results in an equilibrium between the individual right and the rights of others, namely those organizations called 'the filer'.

Traditionally, the Western Europe legislations have envisaged and specified the access right under different facets: the right for the 'filed' to be informed, at the moment of data collection, of the compulsory character or not of this data collection, to know the data user and the finality of the process; the right for the public, in general, to know the existence of files, and through a public Register, the degree of computerization of a society, the relationships between files, their concentration, etc.; the proper access right to one's own information and the subsequent right to correct or erase false data¹⁵. Some evolution of the access right may be observed today through the specific cases of ISDN and Health Smart cards, but we do not need to go into further detail here.

On the side of the 'filer', the principles as accepted inside the public sector have now found their parallelism inside the private sector. The right of collecting, storing, and processing data - briefly the 'right to information' - is submitted to the respect for finality, as expressed in the three principles of legality, specialty and proportionality. Any file or data base must be created by or according to a law. This principle also restores a balance between the legislative and executive authorities, according to some specific mechanisms, amongst whom is the dependency of the control authority. The principle of specialty obliges the legislator to determine precisely the objectives of the data use and to whom they may be addressed. Each administrative authority is only allowed to process data according to the realization of its mission. Finally, the principle of proportionality implies that the administrative data processing, on behalf of the general interest, does not restrict in a disproportionate way the individual liberties¹⁶.

Access right and information right: these rights are the pillars of the Personal Data Protection Laws. Of course, technological advances raise new questions which until now seem to

have been solved in this framework. But there are legislators who hesitate to enact laws according to specific technologies, in particular telecommunication: the European Parliament and the Council of the European Union have however put on the agenda their specific Directive Project on Telecommunication¹⁷. Self-regulation is also advocated by some Data Protection Commissioners in specific cases. The debate remains lively.

What we wanted to stress about the law is that some concepts and principles may be considered as granted. Of course, things have to be scrutinized very carefully, but, as we shall see later, self-regulation cannot prevent Governments from stepping in and regulating the general interest. Quality of data, finality of data, limitation of data, a certain transparency of data seem to be a successful result, although always to be rewon, of the actual legislation. The main threats, as far as we can see, are the opposition that the liberal market is raising between data protection and free flow of information, and the non-equivalent protection provided by the different legislation. But there are also promises in the law, provided we pay full attention to what is already acquired, for instance, in the access right of the citizen¹⁸. One may also think, for instance, at the information right to administrative data. Why not think about expanding these rights by organizing them through citizen associations or by controlling the stage of development of society, using the available registers, etc.

The practice of the 'Early Warning' is recommended!

Codes

Codes are advocated by some people, and rejected by others. They also seem anchored in specific cultural traditions. Is our gleaning of the IFIP national Societies a successful endeavour? If we suppose that all have responded, we cannot say that collecting codes of 13 IFIP national Societies - out of 47 IFIP national and regional Societies¹⁹ - is proving a dynamism towards imminent change of the present regulation. There are precisely 41 national Societies, 2 regional, and 4 corresponding members. New national Societies and affiliates were accepted by IFIP General Assembly of September 5-6, 1994, in Hamburg. But the comparison may be supported with the 15 countries who have signed and ratified the Convention n°108 of the Council of Europe or with the 27 countries world-wide who have adopted a legislation related to the protection of personal data.

Those advocating against Codes are stressing the fact that they favour new 'corporatism', are acting as a pure defense of a profession, the Codes do not include ethical principles *per se* and are most of the time a simple list of recommendations without established and justified priorities. Codes, in this view, may at best be considered as advice to the profession, but do not result in a real societal benefit. From a different point of view, others are stressing that the 'explosion of the profession' or its rather weak identity and the difficulty to define it has, as a consequence, a quasi-impossibility to give a full meaning to the concept of enforcement.

On the other hand, those in favour of the Codes stress that their application can be judged ethically, even if their principles are not ethical *per se*, and that they give orientation and may change the behaviours, especially when society seems to accept unethical habits or customs. Moreover, they insist on the flexibility of the Codes and their role in anticipating the law, and in facing unforeseeable computer abuse.

There are also difficulties which are not arguments *for* and *against*. Let us mention the tension which may exist between the computing profession and the employers. An employee is linked by contract with his/her employer, but bound by the Code to the profession or to his/her association. Who will solve the potential conflicts? Article 9 of the 'GI Ethical Guidelines' (Gesellschaft für Informatik, Germany) recognizes, for instance, this tension and 'encourages its members to stand up for their convictions in situations where their duty towards their employer or a client conflicts with their responsibility towards the persons or groups affected.' Another difficulty may rise from the tension between the associations and the States, or as mentioned earlier, from the self-regulation. It is admitted, in some circles, that self-regulation by computer professional associations has to be enacted to avoid harder legal regulation being imposed on the Computer profession, or to avoid 'a greater degree of statutory regulation', as stated, for instance, in the declaration of the Cadbury Committee on Corporate Governance, established by the London's International Exchange for the Financial Reporting Council and Britain's accounting profession, who issued a Code of best practices for boards of directors on June 30, 1993. The Chairman of the Committee, Sir Adrian Cadbury told the 1993 Corporate Director's Summit in Toronto: 'An argument for compliance (with recommendations of the Committee) is that failure to support our proposals could well lead to a greater degree of statutory regulation'²⁰. Are the Codes a substitute for the law? The question must be solved in considering when a State can no longer avoid becoming involved in a societal controversy²¹.

Difficulties are not arguments. The finest idea would probably be to have self-regulation founded on the law. The law cannot forecast all the problems. But if, for instance, the different national Commissions, as established by most of the laws, have a ruling authority (as is the case for the French CNIL), they could demand general rules of conduct in accordance with the general interest and with the profession care. Codes could also be viewed as having the double role of preparing and specifying the laws, upstream and downstream. But one has also to think of an international harmonization at this level. A restriction by a Code in one country could be prejudicial: the role of international organizations of the profession would be here obvious. Let us remember that the Council of Europe has been working on the specific subject of 'legal problems connected with the ethics of data processing' for three years (1979-1982)²² without adopting a final resolution other than suggesting to explore 'legally' some more sensitive fields such as health care, social security, police, employment, etc.²³ The last report, prepared by Herbert MAISL, for the Council of Europe is dated September 14, 1982: 'Elaboration of an Analysis Framework for Rules of Different Nature related to the Management of Informatics' (CJ-PD[82]19). It was examined during the meeting of September 27-30, 1982, and it was suggested to explore new problems, and to conclude the work which had been done, which meant abandoning the specific question of 'deontology' (CJ-PD[82]31, item 25).

It is also worth mentioning that, before that decision, the Committee of experts 'Ethics of Data Processing' of the Council of Europe had questioned the Data Commissioners Meeting (October 7-9, 1981). The second Report of Activities of the French Commission (CNIL) reports on it as follows: 'The Council of Europe must take into account the spontaneous proliferation of rules of conduct as they appear in all the sectors where computers are present and must suggest to the States Members new ways to explore, either legislative (new principles to set up), or supra-legislative (constitutional rules), or infra-legislative (recom-

mendations or norms to be adopted by the control authorities, or directives coming from the Administration), or even infra-judicial (rules or codes set up by different organizations or associations)²⁴.

This example shows the border lines between codes and the law, and the way it has been achieved in specific cases. But today, reflecting on his experience, Prof. H. Maisl who has been working for a long time on this issue for the Council of Europe thinks that 'the rules of conduct have to reach, beyond the well structured body of computer scientists, the larger circle of computer users. We must shift from a deontology of informaticians to an objective deontology of informatics under the control of the law'²⁵.

We shall come back again, in our Final Remarks in this book, on this sensitive question of self-regulation, and its challenge for democracy.

The European Directive, in Chapter 4, articles 28 and 29, opens the possibility of national Codes and Community Codes in the field of the protection of personal data, but under the supervision of national or Community authorities and insuring official publication²⁶. IFIP could play a similar role for its national Societies to prevent the prejudice which could rise from too high discrimination from one country to another. Self-regulation is today a vivid question which could lead to deregulation: it is important that international regulatory mechanisms can be found. Otherwise, we shall be faced by the minimization of the protection principles!

From the content point of view, the analysis of the existing Codes, inside IFIP, as will appear later, will definitively show that their provisions do not meet all the requirements of the public. Most of them insist only on the competence and efficiency of computing practitioners, on their conscientiousness and honesty, their respect for the Society and for the profession, etc. Jesus Maria Vazquez and Porfirio Barroso have pointed out a list of major concepts and principles as they appear in the analysis of some ten Codes, national and international. These concepts and principles are classified by the authors in decreasing order of frequency: professional secrecy and confidentiality, professional responsibility, loyalty to the firm and to the public, dignity, honesty and honourability, predominance of the common and of the public good or interest, competence and continued training, professional solidarity, professional integrity, right to information, truth and objectivity, duty to avoid the invasion of privacy, use of just and honest means in the exercise of the profession, collaboration in the development and promotion of the profession, copyright, conflict of interest, personal and particular disinterest, fair competition, compulsory character of the code, duty to respect and achieve its target, etc.²⁷

But the public demand is much higher and would include, above the mentioned qualities, their social accountability, their responsibility towards employment and quality of working conditions, their behaviour in mastering conflicts of interests and the explicitness of their rights and duties in assuming the consequences of their work, their attitude towards security, their behaviour with the users and how they take them into consideration, etc.

We would say that we cannot avoid facing some questions such as the meaning of professionalism, the status of the Societies which promulgate the Codes and their legal responsibility in different social and cultural settings²⁸, the membership structures inside these Societies and the rights and duties of the different members. The comparative analysis of the Codes will show us that general conclusions cannot be drawn presently from the available informa-

tion, since situations are linked intrinsically to national legal regulation and culture. Related to the profession, we can here refer to the historical note of R. Sizer in this book²⁹ which also raises questions such as: how to define a profession when some occupations are moving towards interdisciplinarity? What does interdisciplinarity imply for an IT professional? How does one identify an IT professional? Are IT professionals especially needed in areas like safety critical systems? What methods do professional associations use to 'exclude' non-professionals? What kinds of bodies of knowledge and competence do IT professionals need? Why is the functionalist model of professional associations basically Anglo-Saxon in origin?³⁰ How to assess the many differences among professions in different nations?

The emphasis on the profession reveals another difficulty. The building up of information systems requires the competence of many disciplines: over the so-called computer scientists, we need specialists in modelling, lawyers, economists, etc. Their impact on organizations must be assessed in the design itself by sociologists, personnel managers, etc. We cannot expect that the so-called computing profession could control all those dimensions, unless it accepts as constituent of its own definition dimensions which, from a narrow point of view, are considered as meta-scientific. What would it mean, for example, for the IFIP national Societies not to recognize as full members people who are not computer scientists in the sense of having - and only having - a strict formal training and qualification structure in computer science? What would it mean for IFIP itself, when we consider that the previous World Congresses raised so many important questions for the future of computing, but which could not have been handled without the competence of non computer scientists as such?

Codes may surely be 'aspirational', give a vision and objectives, but most probably not only to the profession. They could give guidelines out of the professional context. The distinction between codes of ethics and codes of conduct could find its relevance here: the former being in the order of a 'mission statement', or of guidelines, the latter being more oriented towards the regulation of the profession. Or, in other words, Codes of Ethics would emanate from moral authorities such as the IFIP national Societies or from IFIP itself, without stringent enforcement, while Codes of Conduct would emanate from national bodies with a clear professional vocation and real enforcement rules, which also means a clear recognized status. From this last point of view, one of the roles of IFIP, as an international body, could be to encourage a certain world-wide recognition of professional standing for IT practitioners.

The Respective Roles of Ethics, Law and Codes

Some people are suggesting that the relationships between ethics, law and codes can be clarified in stating that ethics refers to individual conscience, whereas law refers to the society, and the codes to the profession. Things are less simple, above all when we know that IT systems have such an impact on the whole society. We know the joke which states that things are too important to be left in the hands of computer scientists or of the profession.

The traditional mediaeval philosophy mentioned that there are four moral virtues, constituting the field of ethics: prudence, justice, temperance and fortitude. The object of the law was justice, and no more. In that sense, what is just is ethical, but does not exhaust the domain of ethics³¹. On the opposite side, we know today's laws are, from some point of

view, unethical, or at least, amoral. On the other hand, an ethic which would be considered only from the point of view of the individuals would miss its collective dimension. It would lead, in the long run, to the negation of culture, which is always based on symbols which represent systems of values. Systems of values are always dependent upon some reachable consensus, or reflect some collective way of life.

More fundamentally, there is an intrinsic link between ethics and the law: both aim to define the validity of social practices. The law defines this validity from the point of view of legality, i.e. according to a set of rules which are established along criteria of 'justiciability'; on the other hand, ethics defines this validity from the point of view of its legitimacy, i.e. according to its conformity to extra-legal values or principles which refer to cultural traditions and/or conventions.

The challenge of an ethical reflection on computing is not simply a question of self-legitimation in a kind of marketing perspective of the profession itself, for instance. It results from the evolution of the impacts of IT on the society as a whole³². If IT is considered as an indispensable component of the societal life, it is not simply for quantitative reasons, but for qualitative ones, i.e. because IT and IT impacts are measured according to some set of values which judges their support to a social project of development which is related to a collective project of identity reshaping. The ethical question about IT is to assess how it interacts positively, as a component of the social life, with the values which guide the social creation. Are there legitimate *principles* which act positively as guiding-marks for action? And where are these legitimate principles coming from? Principles are established by *convictions* which derive from and are shaped through 'the regulation mechanisms of conflicts, the visions of the world (*Weltanschauung*), and the identity formation'³³. Principles are convictions which are translated in norms of legitimacy, through their 'universalization' and their effectiveness in improving social development. The appreciation of notions such as 'for all' and 'improvement' are delicate. Unanimity means, at least in its weakest sense, the indifference of all, except one³⁴. 'Improvement' implies at least the reference to the deprived people.

Information Technology cannot be dissociated from modern culture³⁵ and from its ideal of self-organization. IT is rooted in deep convictions which are not beyond the scope of the revival of ethics - we shall come back later on the motivation for such a revival. IT is viewed as ambivalent: linked to an increasing vulnerability of society, and of individuals becoming more and more fragile faced with the big 'systems' of social regulation - or de-regulation; but, at the same time, opening up a perspective that favours the communication and a better awareness and understanding of sustainable development.

The challenge for an ethics of IT is to define the legitimacy of IT practices which will promote the principles of reducing the vulnerability of individuals and society, and of promoting a social sustainable development. These two principles can find application fields immediately: privacy and security surely belong to the first, transparency and communication to the second. But everyone may question the role of IT in making people capable of representing reality where he/she acts as a worker, as an employer, as an employee, etc., in the process of dematerializing the manual and intellectual procedures, in controlling his/her own activity, in problem solving mechanisms, in creating artificial intelligence, virtual reality, etc.

The two principles we mention are not far from what is developed by Joseph Weizenbaum: 'There are two kinds of computer applications that either ought not be undertaken at

all, or, if they are contemplated, should be approached with utmost caution. The first kind I would call simply obscene. These are ones whose very contemplation ought to give rise of feelings of disgust in every civilized person. The proposal I have mentioned, that an animal's visual system and brain be coupled to computers, is an example. It represents an attack of life itself. (...) I would put all projects that propose to substitute a computer system for a human function which involves interpersonal respect, understanding, and love in the same category. (...) The second kind of computer application that ought to be avoided, or at least not undertaken without careful forethought, is that which can easily be seen to have irreversible and not entirely foreseeable side effects.³⁶ The first kind is linked to what we have called the 'vulnerability principle'; the second is related to the capacity of maintaining a 'sustainable development'.

Figure 1. Relationships and differences between Ethics, Codes and Law

	Subject	Object	Normativity	Enforcement
Ethics	All	Convictions Principles Moral Good -> Legitimacy of social practices	Quasi-nil	No coercion
Codes of Ethics	Computer Societies	Behaviour in accordance with the ethical principles Specialized fields Emergence of issues	'Aspirational' 'Mission Statement'	Light coercion
Codes of Conduct	Profession	Specialized fields Emergence of issues Dignity of profession	Depending upon the degree of institutionalization	From warning to exclusion
Law	All	Common Good -> Legality of social practices	Maximal	Sanction

The respective roles of Ethics, Law and Codes have to be distinguished. The ethical reflection has to discover in all raised and pending questions the emergence of consensual principles. The Codes have to subsume these ethical principles which are derived from collective negotiation and social acceptance. We could distinguish *two kinds of Codes*: the Codes of Ethics and the Codes of Conduct. The first would be more 'aspirational' and reflect more accurately certain ethical principles - we could consider them as a 'mission statement' of a Computer Society, providing visions and objectives. This kind of Code would allow these Societies to include 'non-professionals' in the strict sense. On the other hand, the

Codes of Conduct would be more oriented towards the profession itself and be more specifically related to professional attitudes. Both kinds of codes have to reflect the values and also, make more obvious and transparent, the issues at stake in the different specialized fields (e.g. specific guidelines in the field of telecommunication, or in software construction and use, etc.). Finally, the law may fix some accepted 'state of the art'.

One cannot expect the same enforcement character from authorities which have different roles in social life. Ethics, law and codes are all, in a way, prescriptive and normative, but not at the same level. First is the negotiation of conflict, visions, autonomous identity, where convictions are shaped, and where principles can emerge. Ethics legitimizes social practices according to the traditions and values which progressively are considered as social assets. The enforcement of the Codes is less obvious, and depends more on the status of the Societies and on the specific national and special regulations: enforcement extends from light coercion and warning to exclusion. The law sanctions what is considered as a threat to individuals and society, and is also sometimes a substitute when there is an absence of other forms of social regulation: it guarantees the rights and fixes the duties that progressively emerge.

Figure 1 tries to visualize some of the main ideas we have developed.

A Revival for Ethics and Codes?

Let us, first, quote one of the highlights of the European FAST-II Programme:

Highlight 20. The importance of ethical and legal innovation: Ethics and Law often go together, the former acting as a push factor vis-à-vis the latter. The 1990s will be characterized by intensive ethical debates particularly concerning life issues. Organ transplants, embryos transfer, 'post-mortem' insemination, brain technology, mental diseases care, plant and animal genetic engineering, bio-material based human prostheses, treatment of senility, will raise considerable concerns among scientists, decision makers and public opinion. Other important debates will concern the protection of data confidentiality, the development of anthropocentric machines, the further use of industrial/chemical processes that increase the vulnerability of the global ecological system, the discharge of dangerous products and wastes in the territory of other countries, etc. Those countries which will favour the largest possible debate on ethics and master the related legal innovation will be better positioned to ease the integration of science and technology into society and therefore the competitiveness of their economy.³⁷

Let us also quote a text from a specific Report on potential ethical conflicts in information and computer science, of the same period:

The need for special ethical considerations in the computer field arises from several unique characteristics of computers and their use. Computers are rapidly becoming the primary repositories of negotiable assets and representations of many other assets in new forms consisting of electronic pulses and magnetic patterns. These assets are not directly subject to manual handling and observation; they can be obtained and used only through technical and automated means. The concentration in computer and data communications systems of vital business information, research and development data, marketing information, and personnel and other statistical data of organizations has

created a power base in electronic data processing (EDP) departments. Because computer technology places a new power in the hands of the technologists who deal with data storage, processing, and dissemination, personal privacy and fair information practices have become major legislative issues. At the same time, however, the technology offers a practical means of constraining and regulating information usage. Unlike the computer field, other sciences and professions have had hundreds of years in which to develop ethical concepts that form the basis for dealing with new issues. Biologists debate issues in genetic research, medical practitioners are concerned with definitions of death and abortion, engineers must cope with the safety of nuclear reactors and the handling of atomic waste materials. Congress debates its rules of ethics, lawyers evaluate the implications of Watergate, and auditors ponder their responsibilities to detect business fraud. The codes of ethics for these disciplines are enforced in varying degrees at various times. They are well-established codes; but perhaps more importantly, an ethical continuity is maintained in each discipline as these codes are transferred from professor to student in universities. In contrast, computer science and technology have been in existence for only 30 years. The need for ethical standards in computer science and technology is equally as critical as it is in other fields. It is little wonder, therefore, that serious problems arise in developing ethical concepts and practices in such a comparatively short period of time.³⁸

The literature on Computer Ethics is overgrowing ... without limits! A single sample through *Information Services, Inc.* shows us that more than 100 papers from Journals, over the last five years, have been recorded and commented on. A report of 1977 mentioned more than 490 references for the period 1954-mid 1977³⁹. Another sample, as gathered by Porfirio Barroso, registered more than 190 books or documents, and nearly the same number of papers in Journals, over the last 10 years, as the basis of his scientific study.

The question immediately raised is: 'Why Ethics today?'

Different answers may be given, as explained earlier. The increasing vulnerability of society which develops new problems for a need of real societal consensus: the IFIP national Societies would have to develop clearer responsibilities. Worms, viruses and other computing abuses must not be attributed to the IT profession, but to some misbehaving hackers or computing tricksters without professional conscientiousness.

These pending questions have already been approached and analyzed by specialized working parties involved, examining, as in IFIP-WG9.6, the relationship between IT mis-use and the civil and criminal law⁴⁰. Privacy questions are well treated by national and international authorities, and in particular fields well developed amongst specialists. Awareness of these questions is crucial, but is already alive. Is it still necessary to go further, and regulate the profession through other mechanisms?

Revival of ethics seems to be present in all the professions, and not only in the computing profession. Extensive literature is also proliferating in other circles, mainly among business, bio-medical practitioners, and bio-technologists.

What seems more interesting to stress is that entrepreneurs themselves, facing the challenge of unemployment, are becoming more aware of their social role. Phenomena such as globalization, or the ascendance of financial logic vs. industrial or technological logic⁴¹, have produced a positive insight on the side of the firms and mainly of the employers.

Ethics in the economic world has taken a predominant position since other discourses seem to have lost their own persuasive meaning. People say that Unions and politicians have lost their credibility, if not religion and metaphysics - in our secularized society. The 'question of meaning' - at least in Western Societies - has exploded in so many dimensions of the social life that each one is trying to re-integrate other facets which, for reasons of specialization, were dismantled. The need for holistic vision and action is felt more and more, as well as the need for 'an integral development' taking into account what was previously divided. *Homo Technicus, Homo Economicus, Homo Sapiens, Homo Religiosus, ...* claims to be *Homo*, with all the social factors which constitute his Universe. Less developed countries teach us, in the recent past, that there is no development without integration: they know it by experience⁴². Western countries learn it also from them, and also from their present experience.

Entrepreneurs are facing day-to-day problems of their firm, including social problems raised out of their aims and aptitudes to cope with. They discover, or re-discover, in the daily contacts, their own commitment to create meaningful situations for their employees and workers.

Ethics does not seem a major preoccupation among those who govern the world at the level of financial globalization, but at the level of firms and organizations which face people in search of understanding their own life. The same may be said at the level of politics, where representatives are accountable to those electing them.

The profession is the level where daily contacts are appreciated. Is it not one of the reasons why ethics is becoming predominant on the scene? One may think about it!

Provisional Conclusion

Before going deeper in the analysis of existing Codes, let us remind ourselves that ethics, law and codes act each at their own level. We have tentatively tried to explain their proper roles. Codes do not need to duplicate what is already in the law, which remains the most powerful normative approach and assign clearly rights, responsibilities and duties to everyone.

But there are so many questions that are at the same time so complex and uncertain that they require exploratory and provisional means before being legally stated and fixed. Codes, as emanating from responsible bodies, could be an answer to these situations of complexity and uncertainty. Moreover, human action may keep its autonomy in fields where there is no need of legal provisions in order to keep sufficient freedom in understanding and interpreting particular situations. The law does not need to interfere with all questions, even if they are sensitive. The field of intervention of the law remains limited to questions of common interest, or when conflicts cannot be solved by negotiation.

Let us come now to our part 2, i.e. the analysis of existing Codes to better understand what they are trying to clarify, or upon which principles they rest.

2. COMPARATIVE STUDY OF CODES (STANDARDS / GUIDELINES) OF ETHICS (PRACTICE / CONDUCT) OF COMPUTER SOCIETIES

Now, in several countries, codes (or standards or guidelines) of ethics (or practice or conduct) produced by computer Societies are emerging⁴³. This phenomenon is new.

Moreover, 'old' codes (BCS Code of Conduct of 1990 and ACM Code of Professional Conduct of 1972) have been updated. New tendencies do appear and new directions are taken. As pointed out by R.E. Anderson *et al.* (1993)⁴⁴:

'Historically, professional associations have viewed codes of ethics as mechanism to establish their status as a profession or as a means to regulate their membership and thereby convince the public that they deserve to be self-regulating. Self-regulation depends on ways to deter unethical behaviour of the members, and a code combined with an ethics review board, was seen as the solution. Codes of ethics have tended to list possible violations and threaten sanctions for such violations... Now the most important rationale for a code of ethics is an *embodiment of a set of commitments of that association's members...* Recent codes of ethics emphasize socialization or education rather than enforced compliance... A major benefit of an educationally oriented code is its contribution to the group by clarifying the professionals' responsibility to society. A code of ethics holds the *profession accountable to the public...* The final and most important function of a code of ethics is its role as an aid to *individual decision making.*'

One may disagree with the statement since it is a requirement of a chartered body, that it shall have a code or codes. Moreover, many insist on the fact that codes are to protect the public from malpractice, not the member!

Methodology

Our study compares recent codes in computer science whatever they are entitled. The old versions are not taken into account here and the code of the Greek Computer Society which can be found in this book was not included in the comparison analysis because it focuses only on medical data protection⁴⁵. Our study is divided into two parts.

The *first part* focuses only on the codes '*sensu stricto*' i.e. on their titles and their contents. This comparison includes the available English versions of codes from the IFIP national computer Societies as well as from others computer Societies. It also includes the Draft Code of H. Sackman which is an essay, but has no particular link to a specific computer Society. First, the wording used in *titles* is paralleled and interesting conclusions are drawn. Then a splitting of codes according to an estimated content level (general / specific) is suggested and shall be used subsequently for the *content* analysis. In this framework, this study suggests a classification of the set of elements which were identified in studied codes. This classification includes several levels. The main categories of this classification (the ones of the first level) and most of their sub-divisions were found after an attentive and careful reading of the first set of the available codes. But, when new codes were received, some sub-divisions were added inside the lowest level of the classification. (Each addition implies, of course, that the first set of codes had to be read again.)

The suggested classification was used as common analysis grid to obtain tables of comparison⁴⁶. The detailed tables with raw data obtained from the comparison of codes contents are only given in the annex. In these tables, the codes are identified by the acronym of the corresponding computer Society except if there are several codes for one Society. These tables have to be considered as tools: they can be used by others, independently of the text of the analysis. The tables of comparison on contents of codes includes references which allow the reader to find directly, in the given code itself, the excerpt concerned. Practically, the rules of codes, except for the CSSA (we explain the acronyms of the Computer Societies hereafter) 'Code of Conduct as applied to a Consultant' and 'Code of Conduct as applied to Salespersons' (in these cases, crosses are used in the tables) are designated by an identifier. This identifier is given in the corresponding code itself except in the case of the CSI, SCS, ICS, ASIS, CEPIS and IPAK. For those, numeration are added for this study. We put this numeration between brackets inside the codes themselves. For the ICS code, the identifiers are chosen so as to point out the conformity to the rules of the CEPIS code. The use of identifiers in the tables allows, moreover, to underline, easily and unambiguously, multiple references to the same topic for a given code. The analysis was performed on a rather textual way: to be included in a category, the rule had generally to contain the word used as a title of the grid column or a word with a meaning very closely related to it. Nevertheless, the suggestions from some members of the Task Group associated with the writing of the Codes (ACM, GI) were taken into account in the tables even if the spirit of rules is also considered by these authors. Some ambiguities were found in several codes. As a result, texts were sometimes interpreted.

The application of the analysis grid to the codes takes into account every single rule of each general code. But some rules and details of most specific codes are not concerned by the grid and consequently they are not taken into account here. On the other hand, it must be noticed that such a cross-analysis has an unfortunate result: it destroys the internal cohesion of the individual codes.

The *second part* of this study investigates the different *environments* of the codes when this information is available: the *status* of each of the Societies which produces the codes(s), his *procedures* (updating and sanction) which are linked to the code(s) and his *membership* structure.

Again, the tables of comparison of environments are given in the annex. But contrarily to the detailed tables of content, they give full texts and indicate the sources.

Next analysis text is not exhaustive so as to be easier to read. It intends only to bring out main convergences and to point out less frequent components. It includes tables with a break-down of the counting of the codes. These tables are designated by the suffix 'Synthesis' in order to be clearly distinguished from the detailed tables which are given in Annex. Let us stress that the numbers inside these 'Synthesis' tables are not at all identifiers of rules inside a given code (as in detailed tables of the annex) but they indicate the account of codes!

Analysis

1. Comparison of Codes (/Standards / Guidelines) 'sensu stricto'

1.1. Codes Used for the Comparison

1.1.1. Computer Societies and Countries Concerned by Used codes

The comparison includes codes pertaining to 20 computer Societies. The term 'Societies' is used here to clearly distinguish with the 'society' as a whole. Our comparison takes into account all the current codes of a given Society. To help the analysis, the Societies are split into the IFIP national computer Societies and the others.

For the 13 IFIP national computer Societies, the implied countries are:

- | | |
|---|--------------|
| • ACM (Association for Computing Machinery) | USA |
| • ACS (Australian Computer Society) | Australia |
| • AICA (Associazione Italiana per l'Informatica ed il Calcolo Automatico) | Italy |
| • BCS (British Computer Society) | UK |
| • CIPS (Canadian Information Processing Society) | Canada |
| • CSI (Computer Society of India) | India |
| • CSSA (Computer Society of South Africa) | South Africa |
| • CSZ (Computer Society of Zimbabwe) | Zimbabwe |
| • GI (Gesellschaft für Informatik) | Germany |
| • ICS (Irish Computer Society) | Ireland |
| • IEEE (The Institute of Electrical and Electronics Engineers, Inc.) | USA |
| • NZCS (New Zealand Computer Society, Inc.) | New Zealand |
| • SCS (Singapore Computer Society) | Singapore |

It must be added that both ACM and IEEE are members of FOCUS (Federation On Computing in the United States). Let us also add that BCS is 'The Chartered Engineering Institution for Information Systems Engineers'.

Inside the set of the 7 other computer Societies whose codes are studied here, some are regional and are IFIP 'affiliate members':

- CEPIS (Council of European Professional Informatics Societies) for Europe, and
 - SEARCC (South East Asia Regional Computer Confederation) for the South East Asia.
- But, most of them are linked mainly to only one country:
- | | |
|---|-----------------|
| • ASIS (American Society for Information Science) | USA |
| • CPSR (Computer Professionals for Social Responsibility and Privacy International) | USA |
| • IPAK (Information Processing Professionals Association of Korea) | Korea |
| • JISA (Japan Information Service Industry Association) | Japan |
| • VRI (Nederlandse Vereniging van Registerinformatici) | The Netherlands |

It must be pointed out that the culture in the majority of this countries is Anglo-Saxon! *Latin countries are really under-represented.* Moreover, to interpret the results of this study, it is important to note that up to now some Societies are not independent but highly linked. On the one hand, the United Kingdom has a computer Society which is a pioneer. On the other hand, many countries corresponding to IFIP national Societies are members of the Commonwealth. Thus, influences of BCS codes and procedures do exist.

1.1.2. Counting of Used Codes

This study analyses a total of 31 codes. In this counting, as we shall explain below, the 'CSSA Code of Conduct as applied to a consultant', and the 'CSSA Code of Conduct as applied to salespersons' are considered as entities separated from the 'CSSA Code of Conduct' itself. For the IFIP national Computer Societies, 21 codes can be counted and for the other ones, 10 codes (including the Draft Code of H. Sackman). Up to now, it must be noted that the 21 codes of the IFIP Societies are not all different: the CSSA Code of practice (1988) is nearly the same as the BCS Code of practice (1978) and the ICS code conforms perfectly to the recommendations of CEPIS! Moreover, let us remark that, as explained by Sizer⁴⁷, Jean Whiley states that the CSZ Code of professional Conduct for Registered Consultants 'has lapsed'.

According to the Society, the rate of aggregation of a code can vary. Some codes can be qualified as 'composite' (see for example the 'CSSA Code of Conduct' which includes: 'The code as applied to a consultant' and 'The code as applied to salespersons'). Some other codes are the result of splitting according to the subject of the rules (see the five codes of CSZ). The codes with sorting of rules can be considered as intermediate between these extremes.

On the other hand, it must be noted that, except the four Societies (BCS, CSSA - as explained above, we count explicitly 4 CSSA codes -, IPAK and SEARCC) which produced two codes and except the only one (CSZ) with five codes -, each Society corresponds to one sole code.

1.1.3. Comparison of the Wording Used in the Titles of Codes

It was expected that the wording used in the titles could reflect several kinds of codes. To test this hypothesis and compare the wording used by each Society, three columns were drawn (see the Tables 1.A. and 1.B. of the Annex for details):

- the first one refers to the word 'ethics',
- the second one, to 'conduct', and
- the last one, to 'practice'.

Then the titles of codes or parts of title or sub-titles were distributed according to the fact that they include the word to which the column refers. Highly interesting remarks can be made about the result of this comparison.

First of all, the counting of the words indicates that the frequencies of the word 'ethics' and of 'conduct' are the same among codes (15 times). But the word 'practice' is rather infrequent (5 times).

Secondly, it must be noticed that two of these words can be used simultaneously in the title or in the title plus a sub-title of a given code. Four codes (JISA, NZCS, CIPS and ACM)

are entitled with both 'ethics' and 'conduct'. Inside two of these four codes (JISA and NZCS), what is 'ethics' is not distinguished from what belongs to 'conduct'! In one other (CIPS), rules of conduct can be considered as explanation of rules of ethics. But in the last one (ACM - version 1992), ethical rules are considered to refer to the society as a whole (i.e. the public) while 'conduct' refers to the profession. Three other codes have the word 'ethics' in the title, but have a sub-title including 'conduct' (ACS and VRI) or 'practice' (CSI). For the first two, again the rules of conduct explain the code of ethics. In the last one, the code of ethics refers only to the computer Society while the codes of practice have other references.

And last but not least, 21 codes are named, in the title and the sub-titles (if they do exist), by only one of the words 'ethics' (8), 'conduct' (9) or 'practice' (4). *No significant content difference can be found between these 8 codes of ethics and these 9 codes of conduct!* On the other hand, all the four codes of practice share some content specificity, as explained below. To temper this last observation, it must be added that, for CSI, the word 'practice' in the sub-title is used without content specificity. Moreover, content specificity does not always correspond to the presence of 'practice' in the title.

To test further the possible correlations between the wording of titles (and sub-titles) and the content of codes, another trial was made (see Table 5.A.1 bis, in the Annex). The various references for rules, as we shall see, are taken into account and the general codes of the IFIP Societies are sorted according to their titles. Clearly, no tendency can be detected. It was thus decided to stop the trials.

To sum up, as for 'ethics', 'conduct' and 'practice' no consensus is found about wording in the code titles: the same words are used by different Societies with different acceptations. The meaning of 'conduct' and 'ethics' seems completely confused and controversial! But for the word 'practice', a general tendency can be pointed out: it is generally used to name a code whose content is specific.

If now the words 'code', 'standard' and 'guidelines' are counted, the last two appear to be infrequently used, respectively thrice and twice (see Tables 1.A and 1.B, in the Annex). The meanings of 'code' and of 'standard' seem equivalent. The word 'guidelines' is used by GI with the usual sense of 'code' except perhaps the peculiar fact that one part of its rules refers to the computer Society itself. The same word designates a set of rules for computer Societies which are members of SEARCC.

1.2. Analysis Grid

To compare the content of all the codes, an analysis grid is useful. The basis of the grid suggested in this study is the noting that any rule of a code (/ standard / guidelines) of ethics (/ conduct / practice) can generally be formulated as follows: 'X is responsible to Y for Z (at a time T)', where we call X the 'subject', Y the 'reference', and Z the 'field of responsibility' (see Figure 2).

Figure 2: General Formulation of a Code Rule and Basic Analysis Grid

X is responsible			to Y	for Z	(at time T)
Subject	Reference	Responsibility field			

Let us take a part of NZCS code as an example:

'IN RELATION TO THE SOCIETY

The member ...

S1 shall not bring the Society into disrepute

S2 shall not, without sufficient authority, represent that views expressed constitute the views of the Society'

According to the suggested grid, this extract can be analyzed as follows: For the rules S1 and S2 of this code the subject is 'the member' and the reference is 'the (computer) Society' itself (NZCS). The responsibility field is the 'respect for the reputation' for S1 and the 'limitation to the competence' for S2. Moreover, it has to be remarked that both rules are grouped (or sorted) according to their common reference.

Consequently, the comparison criteria between the content of the different codes will be:

- *sorting (or grouping) keys* (subject / reference / responsibility field / time) for rules inside codes
- definition of *subjects*
- definition of *references*
- definition of *responsibility fields*.

The *time* is a really infrequent criterion and therefore will not be specified in a separate paragraph.

It must be noted that 'subject' and 'reference' can be correlated. For example, if the subject is a teacher, then the reference usually will be the students.

1.3. An Estimate of the Code Levels: 'General' and 'Specific'

As pointed out before, there are numerous ambiguities in the wording used in the titles of the codes. In this study, it was thus decided to distinguish levels of code according to their content only. In fact, two levels are taken into account: 'general' and 'specific' (see Tables 2, in the Annex).

The 'specific' level implies a *specificity inside the computer science area*. This specificity can be defined also by reference with the previous analysis grid: it is linked to the *time* (cf. the BCS/CSSA Code of Practice) or to the *field of responsibilities* (cf. the CPSR Code of Fair Information Practices [to promote information privacy]) or to the *subject* of rules (cf. the CSZ Training Accreditation Code of Practice [1992] and the CSZ Code of Professional Conduct for Registered Consultants). In the framework of this last specificity topic, it was decided moreover to consider here two parts of the CSSA Code of Conduct ('The code as applied to a consultant' and 'The code as applied to salespersons') as separate entities and to class them into the specific 'codes'. In the sample of this study, no specificity based on reference was put forward but, again, it must be noted that subject and reference can be cor-

related and thus specificity of subject implies some specificity of reference. The so-called 'specific codes' share other common characteristics. It must be noted that most of these 7 codes which are estimated here as specific include the word 'practice' in their title: BCS Code of Practice, CSSA Code of Practice, The CSZ Training Accreditation of Practice, CPSR Code of Fair Information Practices. Moreover, the specific codes are in general not so easily analyzed with the grid and with the fields of responsibility as explained hereafter. Indeed, some are written in 'free text' (i.e. without individual rules) ('The CSSA code as applied to a consultant' and 'The CSSA code as applied to salespersons'). Moreover, except the CPSR code, all of them include topics not generally taken into account by the general codes. From this point of view, the CPSR code is different from the other codes estimated as specific. Later, in this analysis, the CPSR Code will be thus generally joined to the general codes of the other national Societies.

All non specific codes, as defined above, are considered to be 'general'. They can also include some kind of levels (for example, one for the rules themselves and one for their explanation or development).

The distinction between general and specific codes, as defined here, will be used further in the analysis. It will be seen that it is really fruitful.

1.4. Sorting Keys for Rules Inside Codes

Frequently, the individual rules of codes are sorted and grouped into several sets. The possible sorting keys are precisely the items which are highlighted by the suggested analysis grid: subject, reference, responsibility field and time.

Some methodology and wording details must be added here. First of all, the CPSR code is not included in this part of the analysis because it focuses specifically on only one responsibility field. Next detail: sometimes, more than one level of keys are encountered in the studied codes. This implies that the rules are sorted first on a 'first' key and then, inside this first key, on a second key (named the 'secondary' key). But, only two codes are sufficiently detailed to have two levels of keys. Moreover, the same code can contain rules sorted on one key and other rules on another one. It also happens that rules can be considered as sorted on one key of the analysis grid or on another one. Let us consider, for example, the groups 2 (rules 2.1 to 2.8) and 3 (rules 3.1 to 3.6) of the ACM Code which are entitled respectively:

- 'More specific professional responsibilities. As an ACM computing professional, I will ...'
- 'Organizational leadership imperatives. As an ACM member and an organizational leader, I will ...'

Both groupings can be estimated as based on subject or on reference. In this case and in similar cases, the rules are written twice in the corresponding detailed Tables 3 (Annex). So it was needed to introduce the distinction between the 'main' key (i.e. the most frequent key inside the code when there is only one level of key but several different keys can be considered simultaneously in the same code) and the 'only' key (when only one level of keys and one key is used in a given code). To stress the main observed tendencies, Table 3 (which synthesizes Tables 3.A.1, 3.A.2 and 3.B of the detailed Tables in Annex) can be drawn:

Table 3. Synthesis: Breakdown of the number of codes according to the MAIN (/ONLY / FIRST) SORTING KEYS FOR RULES

	Subject	Reference	Responsibility field	Time	No sorting	Total
General codes of IFIP Nat. Soc.	1	6	4		4	15
Specific codes of IFIP Nat. Soc.			1	2	3	6
General codes of other Soc.	1	6 (includ. CEPIS)			2	9*
Global total	2	12	5	2	9	30

* This number does not include the CPSR code

From this Table 3. Synthesis the following remarks can be made.

For the used codes and, particularly, for general codes, the most frequent main (/only / first) sorting key (respectively 12/30 and 12/24) is 'reference'. Globally, 'Responsibility field' is less frequently (5/30) used as main (/ alone / first) key to sort the rules. But its frequency is slightly higher (4/15) in general codes of the IFIP national Societies. 'Time' and 'subject' are unusual main (/ alone / first) sorting keys. The time - the values of this key are: 'contracting', 'development', 'implementation', and 'live systems' - is used only in two specific codes of IFIP national Societies (BCS Code of Practice and CSSA Code of Practice which are nearly identical). The subject is used in two general codes. Moreover, this Table 3 shows that many codes (9/30) do *not* sort their rules at all. Indeed they are too short to need a sorting (cf. the AICA code, four CSZ codes, the SEARCC guidelines and the VRI code), either they are written in free text, i.e. without really distinguishing individual rules (cf. the CSSA Code of Conduct as applied to a consultant and the CSSA Code of Conduct as applied to salespersons: as explained above, they are, in fact, parts of the main code but are considered in this studies as individual entities). It must be pointed out that both codes in free text are specific (to their subject).

Let us make a last remark: from the detailed comparison of sorting keys, some links between codes can be pointed out:

- CIPS Code - NZCS Code
- ACS Code - CSSA Code of Conduct (except as applied to consultant or salespersons) - CSZ Code of Ethics for all Individual Members - SCS Code.

These last four codes are derived from a previous BCS Code of Conduct.

1.5. Definition of Subjects

The rules of a code can have an *individual* or an *institutional* subject.

In the sample of this study, the categories of individual subjects which can be concerned by codes are all the members, the computer professionals, the voting members, the leaders, the salespersons, the teachers, and the consultants (Table 4).

The institutional subjects are companies (or organizations), computer Societies (or Society), international organizations, providers for Information Technology training organization, Societies influencing international legal informatics or Societies influencing international public policy (Table 4 [continued]).

Table 4. Synthesis: Breakdown of the number of codes according to the SUBJECTS FOR RULES OF CODES

	Individual subject						
	All	Computer Professionals	Voting*	Leader	Sales-persons	Teacher	Consult.
General codes of IFIP N. Soc. (15)	12	1	2	4		3	5
Specific codes of IFIP N. Soc. (6)	2				1		2
General codes of other Soc. (10)**	7 (incl. CEPIS/SEARCC)						
Global total (31)	21	1	2	4	1	3	7

* Named 'corporate' in CSZ.

** This total includes the CPSR Code.

Table 4. Synthesis (continued): Breakdown of the number of codes according to the SUBJECTS FOR RULES OF CODES

	Institutional subject					
	Company/organiz.	Computer Societies/Society	Internat. organiz.	Providers of IT train. org.	Soc. infl. int. legal informatics	S.infl.int. public policy
General codes of IFIP N. Soc. (15)	1	1				
Specific codes of IFIP N. Soc. (6)				1		
General codes of other Soc. (10)*	1	1 (?)	1		1	1
Global total (31)	2	2	1	1	1	1

* This total includes the CPSR Code.

Several comments can be made before the comparative analysis of subjects. Firstly, let us note that the different categories do not correspond to a partition: for example, the same person can be a simple member of the computer Society and a leader and/or a teacher. Then, it must be remarked that the subjects of rules in a code are linked to the membership structure of the corresponding computer Society. It is obvious, for example, that a Society in which all the individual members have the voting right, will not produce rules specially dedicated to voting members.

On the other hand, the subjects of rules have to be clearly distinguished from the members of the corresponding Society. Indeed, it happens that they do not coincide. So, the rules of the GI code have an individual subject (the members) or an institutional one (the GI itself)! Moreover, the CEPIS code and the SEARCC guidelines are addressed to their respective members i.e. computer Societies. But both contain rules whose subjects are individual members! Also the draft Code of H. Sackman includes some rules dedicated to individuals but the code itself is designed notably for computer Societies. But it will not be pointed out in this study because it is not recognized and adopted by a Society. Thus, both CEPIS and SEARCC codes are really informative about recommendations for an international body such as IFIP. They will thus receive special attention in this study.

Let us now perform the comparative analysis. The first remark is as follows: the rules with individual subjects are much more frequent than the other ones. As for individual subjects (Table 4), the great majority of IFIP general Societies (12/15) gives rules whose subjects are 'all the individual members'. Moreover, both the CEPIS code and the SEARCC guidelines include only rules which must be respected by all the individual members. On the other hand, among the 15 general codes of IFIP Societies:

- consultants are concerned by 5 codes,
- leaders, by 4 codes,
- teachers, by 3 codes,
- voting members only, by 2 codes, and
- computer professionals, by 1 code.

Next details can be added. Within the codes of IFIP Societies, GI is the only one to contain simultaneously rules for individuals and rules for an institution (the GI itself). All the other rules for organizations of the IFIP Societies are set in peculiar codes and produced by CSZ: one is general and one is specific to the providers of IT training organizations. Within the non-IFIP Societies codes, the proportion of those whose subject is institutional is higher. The draft Code of H. Sackman appears really special because of the identity of the institutional subjects: International organizations, Societies influencing international legal informatics, Societies influencing international public policy. Moreover, as GI code, it contains simultaneously rules for individuals and institutions.

It must be noted that the subject of the SEARCC Codes of Ethics is ambiguous: it can be interpreted as being the computer Societies (which are the members of the SEARCC) but this should be confirmed.

1.6. Definition of References

Three levels of references are distinguished for rules inside codes. Arbitrarily, but as in CIPS Code of Ethics and Standards of Conduct, responsibility to oneself and to the profession are joined. Similarly, reference to the computer Society is put in the same category. So we obtain the next three levels of reference (Table 5, detailed in three tables in the Annex):

- the public,
- the organization, and
- oneself or the profession or the computer Society.

Let us add that IPAK, in both of its codes, associates the country with the computer Society as a reference for rules. This case is an exception.

On the other hand, several sub-categories are described into the second level to take into account various groups pertaining to, or related to the organization(s): clients or users, employer, employees, sponsors, colleagues, students or aspirants.

From the comparative analysis, several conclusions can be drawn. First of all, *in nearly all the general codes (of the IFIP Societies as well as of the others), the three levels of reference defined above are taken into account.* The only exceptions are, in fact:

- no reference to the public in the CSZ Code for Institutional members, the CSZ Code for all Individual members, the IPAK standards of conduct and in the SEARCC Code of Ethics;
- no reference to the organization in the CSZ Code for all Individual members and in both codes of SEARCC;
- no reference to oneself or the profession or to the computer Society in the AICA code.

Table 5. Synthesis: Breakdown of the number of codes according to the REFERENCES FOR RULES IN CODES

	Public	Organization							Oneself/ Profession/ Comp. Soc.
		as a whole	clients/ users	employer	employees	spons.	colleag.	stud./ aspirant	
General codes of IFIP N. Soc. (15)	13	3	13	6	4		5	4	14
Specific codes of IFIP N. Soc. (6)	2		6	2	2		2	1	1
General codes of other Soc. (10)*	8 (incl. CEPIS/ SEARCC)		6 (incl. CEPIS)	3 (incl. CEPIS)	2	1	2		9 (incl. CEPIS/ SEARCC)
Global total (31)	23	3	25	11	8	1	9	5	24

* This total includes the CPSR code.

On the other hand, most of the specific codes of IFIP Societies set rules which refer only to the organization! Moreover, as for the reference to the organization, the sub-division used most frequently among the whole set of codes is 'clients/users' (25/31). Other frequent categories are 'employer' (11/31), 'colleagues' (9/31) and 'employees' (8/31).

1.7. Definition of the Responsibility Fields

1.7.1. Introduction

The responsibility fields covered by the different codes are quite various and described in various terms. In this study, they were grouped in main categories as follows:

- Respectful general attitude,
- Personal (/ institutional) qualities:
 - Conscientiousness
 - Honesty and positive attitude
 - Competence and efficiency
- Promotion of information privacy and data integrity,
- Production and flow of information,
- Regulations.

In the next part of the analysis of codes, some rules or parts of rules can be put away in several classes: the classification is, again, not a partition.

Up to now, it must be pointed out that, as for the majority of responsibility fields, the specific codes behave very differently from the general ones! Only exceptions to this fact will be stressed below.

1.7.2. Respectful General Attitude

First of all, let us remark that there is a link between this responsibility area and the reference of rules. Each time a trichotomy is made between (Table 6):

- the 'public' (or the 'society as a whole'),
- the 'organization' (or the 'involved people'), and
- the set of the 'computer Society' (plus the country, in the case of IPAK) and the 'profession'.

Then let us make clearer these three categories and their sub-divisions: when in reference to the computer Society, the respect often concerns the reputation, sometimes the interest, and rarely the aim or the rules of competition, or the policies, or the improvement, or the resources. When in reference to the profession, the respect is for the prestige. When in reference to involved people, it affects the interests or rights, the quality of life and the differences (sexual, racial, etc.). The respect for the public includes the following topics: welfare and health or quality of life, interests or rights, differences; or it can be considered in general. Finally, respect for the environment is not detailed.

As shown in Table 6, the next topics, linked to the respectful general attitude, are frequently considered in the studied codes:

- *the interests or rights of the involved people* (15/30) of the codes;
- *the prestige of the profession* (11/30 of the codes and particularly 10/24 of the general codes);
- *the interests or rights of the public* (11/30 of the codes and particularly 11/24 of the general codes);

- *the welfare and health of the public* (10/30 of the codes and particularly 10/24 of the general codes);
- *the respect for the reputation (etc.) of the computer Society* (8/30 of the codes and particularly 8/24 of the general codes).

Table 6. Synthesis: Breakdown of the number of codes according to the RESPON. FIELD: Respectful General Attitude

	C. Soc.	Profes.	Involved people			Public				Envir.
	Reputation/ etc.	Prestige	Interests/ rights	Qual. of life	Dif.	Welfare & health Qual. of life	Inter./ rights	Dif.	In gen.	
General codes of IFIP N. Soc. (15)	4	7	9	4	2	6	8	2	4	4
Specific codes of IFIP N. Soc. (6)		1	3							
General codes of other Soc. (9)*	4	3 (incl. CEPIS)	3	2	1	4 (incl. CEPIS & SEARCC)	3 (incl. CEPIS)	2	2 (incl. SEARCC)	2 (incl. CE-PIS)
Global total (30)	8	11	15	6	3	10	11	4	6	6

* This total does not include the CPSR code.

Some categories are, on the contrary, relatively rare. Here they are given according to a decreasing frequency:

- *the respect for the quality of life of the involved people* (6/30 of the codes and particularly 6/24 of the general codes);
- *the respect for the public in general* (6/30 of the codes and particularly 6/24 of the general codes [including SEARCC]);
- *the respect for the environment* (6/30 of the codes and particularly 6/24 of the general codes [including CEPIS]);
- *the respect for the differences of the public* (4/30 of the codes and particularly 4/24 of the general codes);
- *the respect for the differences of the involved people* (3/30 of the codes and particularly 3/24 of the general codes).

1.7.3. Personal (/ Institutional) Qualities: Conscientiousness, Honesty and Positive Attitude

Most of the codes include rules about personal or institutional qualities. In this study, these qualities are divided into two parts:

- conscientiousness, honesty and positive attitude, and
- competence and efficiency.

'Conscientiousness' is itself sub-divided into four categories:

- Responsibility acceptance
- Concern to meet overall objectives
- Conscientious work
- Professionalism.

Table 7 indicates that the majority of the general codes (16/24) and even of the whole set of the codes (19/30) share the concern for *acceptance of responsibility*. Moreover, nearly half the general codes of the IFIP Societies (7/15) but only a few general codes of the others (2/9) insist on the importance of *conscientious work*. Contrary to the general codes, the specific codes of IFIP Societies pay practically no attention to 'conscientiousness' in general. On the other hand, the *concern to meet overall objectives* and the *professionalism* are topics not frequently encountered even in the general codes. Nevertheless, let us note that the CEPIS code recommends the *professionalism*.

Table 7. Synthesis: Breakdown of the number of codes according to the RESPON. FIELD: Conscientiousness

	Acceptance of responsibility	Concern to meet overall objectives	Conscientious work	Professionalism
General codes of IFIP N. Soc. (15)	9	1	7	4
Specific codes of IFIP N. Soc. (6)	3	2	2	
General codes of other Soc. (9)*	7 (incl. CEPIS)		2	3 (incl. CEPIS)
Global total (30)	19	3	11	7

* This total does not include the CPSR code.

As to 'honesty' and 'positive attitude', they are concerned by:

- Personal (/ institutional) integrity
- Respect for requirements or contracts or agreements
- Credit for work done by others
- Good faith or goodwill
- Courage of one's conviction
- Acquaintance with technology evolution.

As it appears in Table 8, nearly all the general codes (20/24) and all the specific codes recommend *integrity*, while this basic concept is described by various words according to the different codes and, even, inside a given code, and moreover they do so several times (up to 7 times: see Tables 8.A.1 and 8.B in the detailed annexes). Thus, this topic appears really fundamental in a code. As for the *respect for the requirements (or contracts or agreements)*, it is included in the rules of less than half of the general codes and in 14 codes among the whole set

of 30. It must be noticed that both topics are usual in the specific codes as well as in the general ones.

Table 8. Synthesis: Breakdown of the number of codes according to the RESPON. FIELD:
Honesty and positive attitude

	Personal (/ institut.) integrity	Respect for requ./ contracts or agreement	Credit for work done by others	Good faith /goodwill	Courage of one's conviction	Acquaintance with technology evolution
General codes of IFIP N. Soc. (15)	13	7	5	2	1	
Specific codes of IFIP N. Soc. (6)	6	4	1	1		
General codes of other Soc. (9)*	7 (incl. CEPIS)	3 (incl. CEPIS)		1		1
Global total (30)	26	14	6	4	1	1

* This total does not include the CPSR code.

Moreover, several general codes of the IFIP Societies (5/15) are distinguished by encouraging *credit for work done by others*. The three last topics of Table 8 (*good faith or goodwill*, *courage of one's conviction*, and *acquaintance with technology evolution*) are really infrequent.

1.7.4. Personal (Institutional) Qualities: Competence and Efficiency

The personal qualities as expressed by the codes are: competence and efficiency (see Table 9).

Table 9. Synthesis: Breakdown of the number of codes according to the RESPON. FIELD:
Competence and efficiency

	Competence				Efficiency		
	General	Limitation to the field of compet.	Profes. dev. / training	Prof. review	Effectiv. / Work quality	Best use of resources	I. S. improv.
General codes of IFIP N. Soc. (15)	8	10	12	3	5	3	
Specific codes of IFIP N. Soc. (6)		4	2		2		
General codes of other Soc. (9)*	5	4 (incl. CEPIS)	5 (incl. CEPIS/ SEARCC)	1	5 (incl. CEPIS)		2
Global total (30)	13	18	19	4	12	3	2

* This total does not include the CPSR code.

Competence is evaluated in terms of:

- general competence
- limitation to the field of competence (for oneself, subordinates, consulting experts, etc.)
- professional development or training (for oneself or others)
- professional review.

Efficiency is subdivided into:

- effectiveness or work quality
- best use of resources
- information system improvement.

Table 9 shows that most general codes insist on the *professional development* (for others or for oneself) (17/24) and on the *limitation to the field of competence* (14/24). More than half of them (13/24) require *general competence*. More general codes of other Societies (5/9) than general codes of IFIP Societies (5/15) point out the need for *work quality*.

The last three categories (*professional review*, *best use of resources* and *Information System improvement*) are only exceptionally included in the studied codes.

As for the specific codes of the IFIP Societies, they do not frequently speak explicitly about 'competence' or 'efficiency' in general. It must be noted however that many of them (4/6) recommend the *limitation to the field of competence*.

1.7.5. Promotion of Information Privacy and Data Integrity

Some rules of the codes are devoted to the promotion of information privacy and data integrity. This field covers the following six sub-fields (Table 10):

- privacy in general,
- no computer crime nor information piracy or misuse,
- confidentiality,
- respect for property,
- data minimization,
- data integrity (accuracy / security / reliability).

Information privacy and data integrity (and flow of information) are the only areas which are taken into account by the CPSR code. Here, this code is of course included in the analysis.

Confidentiality is required by the majority of the general codes of the non-IFIP Societies plus the CPSR code (6/10) and, particularly, by nearly all the general codes of the IFIP Societies (13/15). *Respect for property rights* is called for by more than half of the general codes of the IFIP Societies (8/15) and by less than half of the set of the general codes of the others plus the CPSR code (4/10). But this set demands more frequently (6/10) *privacy in general* than the general codes of the IFIP Societies (6/15).

Again, this responsibility area in general is less frequently included in the specific codes of the IFIP Societies. However, half of them requires *confidentiality*.

Table 10. Synthesis: Breakdown of the number of codes according to the RESPONS.
FIELD: Promotion of information privacy and data integrity

	Privacy in general	No computer crime/information piracy or misuse	Confidentiality	Respect for property rights	Data minim.	Data integrity (accur./secur./reliability)
General codes of IFIP N. Soc. (15)	6	4	13	8		2
Specific codes of IFIP N. Soc. (6)	2		3			2
General codes of other Soc. (10)	6 (incl. CEPIS)	3	6 (incl. CEPIS)	4 (incl. CEPIS)	2	2
Global total (31)	14	7	22	12	2	6

1.7.6. Production and Flow of Information

Table 11 summarizes the production and flow of information as they are required by the codes.

As for the production of information, two topics can be found in the studied codes:

- tests, evaluations, or results, or specifications
- comprehensive (and unambiguous) information.

Table 11. Synthesis: Breakdown of the number of codes according to the RESPONS.
FIELD: Production and flow of information

	PROD. OF INFORM.		FLOW OF INFORMATION				Interdisc. discuss.
	Tests, eval. / results / specif.	Compreh. information	To the public	To involved parties or people	From involved parties or people	To comp. Society	
General codes of IFIP N. Soc. (15)	3	5	11	12	3		1
Specific codes of IFIP N. Soc. (6)	2	6		5	2		
General codes of other Soc. (10)*	2	3 (incl. SEARCC)	5 (incl. CEPIS/SEARCC)	6 (incl. CEPIS)	2	2	
Global total (31)	7	14	16	23	7	2	1

* The CPSR code is included here also in the analysis.

For the flow of information, five categories are distinguished:

- to the society (or public)
- to the involved parties or people (such as risks, limitation, costs, conflict of interest, etc.)
- from the involved parties or people
- to the computer Society
- interdisciplinary discussions.

Flow of information to the involved parties or people is required by the majority of the general codes of both sets of IFIP Societies (12/15) and of the others (6/10, includes CPSR). *Information to the public* is also often demanded by the general codes (16/25). Moreover, some general codes (8/25) call for *comprehensive information*.

The specific codes do insist even more frequently than the other ones on *comprehensive information* (6/6) and on *information to the involved parties or people* (5/6) but they ignore totally the flow of information to the public.

Concerns about *tests, evaluations etc.* (7/31), *information from the involved parties or people* (7/31) and above all, *flow of information to the computer Society* (2/31) and *interdisciplinary discussions* (1/28) are not frequent in the studied codes.

1.7.7. Regulations

The regulations evoked in the codes include three major domains (Table 12):

- the ethical code itself
- the laws
- the information technology and professional standards.

Let us add that many Societies specify information on enforcement and sanction outside their code(s) themselves, as we shall see below.

Table 12. Synthesis: Breakdown of the number of codes according to the RESPONS.
FIELD: Regulations

	ETHICAL CODE			LAWS		IT/PROF. STAND.	
	Respect	Sanction	Develop.	Respect	Develop.	Respect	Improv./ Develop.
General codes of IFIP N. Soc. (15)	8	6		6	1	7	3
Specific codes of IFIP N. Soc. (6)	3	1		3		2	
General codes of other Soc. (9)*	2	2	1	4 (incl. CEPIS / SEARCC)	1	3 (incl. CEPIS)	2 (incl. CEPIS)
Global total (30)	13	9	1	13	2	12	5

* This total does not include the CPSR code.

For each of these domains, *respect* and *development* (or *improvement*) are taken into account. Moreover, *sanction* is also considered about the code.

The regulations do not appear as a major theme of the codes.

But the majority of the general codes of the IFIP Societies (8/15) requires explicitly the *respect for the code*. Nearly half of the general codes of the IFIP Societies speak about *respect for standards* (7/15) and for *the laws* (6/15) and *sanction for code break* (6/15).

Globally, *development of the code*, *development of law* and *of standards* are not frequently evoked in the studied codes. But the CEPIS code speaks about *improvement of standards*.

2. Comparison of Codes (/ Standards / Guidelines) Environments

To put the finishing touches to the analysis of the codes, what is called here 'their environments' will now be compared.

In fact, the following topics will be taken into account:

- sanction levels,
- disciplinary procedures,
- updating of code,
- status of the Society,
- membership structure.

The available information about these topics is very sketchy. It is linked nearly exclusively to the IFIP computer Societies.

The first two paragraphs below complete the regulations about the code as considered above.

2.1. Sanction Levels

About the levels of sanction against a breach of the code, we have data for only 10 IFIP national computer Societies.

Table 13.A. Synthesis: Breakdown of number of levels of sanction for 10 IFIP Societies

Number of levels of sanction	4	3	1
Number of Societies	2	3	5

Table 13.A. shows the breaking down of the number of levels for these Societies. A total of 5 different levels of sanction are taken into account:

- striking (or revocation or forfeiture or exclusion): 10 times
- suspension: 5 times
- reprimand: 2 times
- caution or warning: 2 times

- other:

2 times (N.B.: once, a fine is specified).

2.2. Disciplinary Procedures

Disciplinary procedures are extensively explained for 7 IFIP Societies.

According to the IFIP Societies, the number of steps in disciplinary procedures is distributed as showed in Table 14.A:

Table 14.A. Synthesis: Breakdown of number of steps in the disciplinary procedures

Number of steps	5	4	1
Number of Societies	1	5	1

No Society suggests more than 5 steps but the total number of different steps is 7.

Here are the successive steps with their respective frequency in the sample of 7 Societies:

1. Complaint: 7 times
2. Suggestion to reconcile: 1 time
3. Investigation: 5 times
4. Hearing Process (including decision): 6 times
5. Appeal Process: 3 times
6. Publication of Opinion: 4 times
7. Record Retention: 1 time.

Outside the IFIP Societies, we do not have information except the fact that the VRI has also a complaint procedure.

And what about the use of a disciplinary procedure? For CIPS, D. Whitehouse⁴⁸ writes: 'It is my understanding that there has never been a case in which improper behaviour has been brought to the attention of CIPS in this form nor that the CIPS disciplinary procedure has been implemented.'

2.3. Updating of Code

Information on the procedure of updating the code is known only for 6 IFIP national Societies. For CSZ, the updating is annual; for GI, it is qualified as 'regular'; for BCS, it is made when necessary; for CIPS, there is no formal mechanism for the code review, and for both NZCS and CSSA, it is not foreseen! On the other hand, a last information about GI indicates that: 'The GI takes the obligation to let amend the Ethical Guidelines in a continuous discourse' (Art. 2.3 of the GI's Statutes).

For the BCS, according to Sizer⁴⁹, 'Responsibility for the content of the codes lies with the Vice-President Professional and the Professional Board. It is their task to keep both codes under review and to advise Council of the nature, content and timing of suggested changes. Council gives formal approval to such changes. (...) The actual task of reviewing and

re-drafting of the codes lies with the Professional Advisory Committee (PAC) which is a standing committee of the Professional Board. The PAC treats the two codes as separated documents with different review time-scales; changes are made only as and when necessary, the aim being to achieve stability. The current version of the Code of Conduct (1992), for example, replaces the version adopted by Council in 1984.⁷

2.4. Status of the Society

We got information about the status of 8 to 10 national IFIP Societies and of CEPIS and VRI (See Tables 16. A and 16. B, in the Annex). Let us note that the BCS is 'incorporated by charter', the NZCS is qualified as 'incorporated' and the SCS, as 'registered'. The GI is also said 'incorporated', but the meaning seems different.

As explained by Sizer⁵⁰, 'a Charter is granted by the Crown after stringent criteria are met. The granting of the Royal Charter in 1984 established the BCS as "a privileged agent of the Crown, providing a service to society within the field of computing" '.

According to a booklet from the CEPIS' Office, CEPIS is a non-profit organization with the following mission: 'to provide a co-ordinated European voice that is able to represent to European institutions the views of European Informatics professionals on major issues.' Moreover, the CEPIS 'Task Force concerned with professional development and qualifications has the aims of:

- (...)
- establishing appropriate linkage between the requirements for principal skills and the need to promote high levels of professional and ethical conduct (a Professional Code).

A code of Conduct has been completed, and adopted by CEPIS Council for use by all member Societies.⁷

2.5. Membership Structure

It is not easy to compare the membership structure of the IFIP national computer Societies. Indeed, the wording is again misleading: identical qualifiers can correspond with different status (for example, practitioners or not) and with different rights (for example, the voting right or not). Moreover, the membership structure is sometimes complex and details are not always clearly explained. As a result, our comparison is only a trial (See Tables 17. A and 17. B, in the Annex). Of course, it does respect the specific wording used by each Society but does not base the classification on this wording.

The main dichotomy of the membership structure is between individual and institutional members. We know that 4 IFIP Societies have institutional members. According to Sizer⁵¹, for the BCS, 'there are four categories of 'institutional' members:

- Institutional Affiliate,
- Business Affiliate (sub-divided into three, dependent on the number of employees),
- Education Affiliate,
- UK School Affiliate.⁷

Who can become a Business Affiliate? 'Any business, public body or operating unit can apply for enrolment as a single entity. Where operating units or subsidiaries are largely independent it is usual for them to enrol separately.'⁵²

Within the individual members, next dichotomy (according CSZ) is between the members entitled to vote and the others. Moreover, some Societies distinguish explicitly between grades for professional information processing practitioners and grades for non-professional practitioners.

'The criteria of membership of the BCS are complicated but, broadly, possession of an honours degree, or equivalent, in a relevant subject is a minimum requirement. However, to satisfy the criteria overall, applicants must prove that they have the requisite mix of academic qualifications, accredited training and responsible experience. The quality of the academic qualifications and accredited training will determine the level of responsible experience required.'

It must be remarked that the highest number of grades is found in BCS and Societies linked to BCS.

Table 17.A. Synthesis: Breakdown of number of grades in the membership structure of the IFIP Societies

Number of grades	1	2	3	5	6	7	9
Number of Societies	5	1	3	1	1	1	1

According to our comparison, there is a consensus between the Societies about the meaning of some grades (for example, student member or affiliate member) but a real conflict about some others (Fellows and, particularly, Associate).

7 of the 18 studied Societies have institutional members.

Some specifications seem particular in AICA.

- In this Society, only the 'ordinary members' must sign the code of conduct.
- Moreover, it is possible for an institution to become a 'patron member' of AICA.

Detailed information is available about CEPIS. According to leaflets from this Society: 'Informatics Societies from the following countries participate in the work of CEPIS: Austria (OCG), Belgium (SAI), Cyprus (CCS), Denmark (DD), Finland (FIPA), France (AFCET, AFIN), Germany (GI, ITG im VDE), Greece (GCS), Hungary (NJSzT), Ireland (ICS), Italy (AICA), Netherlands (NGI, VRI), Norway (DND), Poland (PIPS), Spain (FESI), Switzerland (SI), United Kingdom (BCS).'

CONCLUSION

The analysis of these existing IT codes shows a great convergence as far as the content is concerned. It could inspire the national Computer Societies which do not have any code at the present moment. It could also help those who have their code for when they update it. It appears that some themes would have to be treated more intensively in order to meet the

requirements of the ethical principles we have suggested: containing the vulnerability of individuals and society, and promoting a sustainable development. In any case, in each cultural, social and juridical situation, one has to examine which are the principles already included in the law, before specifying the most appropriate rules which could at the same time respond to the interests of the Computer Society, the profession and the public.

Codes do not pretend to solve all the questions, but they may help to create awareness, to supplement the law, and to reinforce ethical behaviours. When the role of self-regulation seems to increase, the respective roles of ethics, law and codes have to be more carefully scrutinized, but they may lean on each other. The codes offer an already experienced 'framework on ethics' which may help to maintain openness and feed the needed dialogue in the 'spaces of discussion'.

¹ A summary of this study (on the basis of the Codes which were provided to us at that time, i.e. two less than we have now) has been published in: *Information Processing '94*, vol. II, *Applications and Impacts*, Kl. BRUNNSTEIN and E. RAUBOLD eds, Proceedings of the IFIP 13th World Computer Congress, Hamburg, Germany, 28 August - 2 September, 1994, North-Holland 1994, IFIP Transactions A-52, pp. 340-348.

² IFIP-WG3.1 published in 1992 a paper on 'Informatics in Secondary Schools', the first in a planned set of Guidelines for Good Practice. The authors, Harriet TAYLOR, Robert AIKEN and Tom VAN WEERT, stress the importance of making the students aware of the importance of ethics in computing. (See *IFIP-Newsletter*, Vol. 9, no. 2, June 1992). One may also refer to the development by Lonnie MOORE, Computer Security Manager at Lawrence Livermore National Laboratory in California, of a multimedia presentation including a puppet show (Gooseberry, who makes computer mistakes due to a lack of proper training; Chip, a computer with the machine's unique viewpoint; and Dirty Dan, a computer crook whose high-tech crimes know no limits), videos, colouring books, ... (*Compuserve Magazine*, June 1993, p.6).

³ See, for instance: 'Fujitsu Limited Principles of Conduct. Purpose, Principles of Conduct, Standards of Conduct' (August 1987) or 'IBM Business Conduct Guidelines' (September 1993).

⁴ See Fr. W. CONNOLLY, St. W. GILBERT, P. LYMAN, J. EDWARDS, R. LEDERMAN, and M. MERRILL, A Bill of Rights for Electronic Citizens, in: *EDUCOM Review*, 1991, Vol. 26:2, pp. 37-41, and Vol. 26:3/4, pp. 53-56. See also, Jim WARREN, Bill of Rights for the 21st Century Workshop, Paper presented at DIAC-92 (Directions and Implications of Advanced Computing), CPSR (Computer Professionals for Social Responsibility), Berkeley, May 2-3, 1992.

⁵ Herbert MAISL, Legal Problems Connected with the Ethics of Data Processing, Study for the Council of Europe (CJ-PD[79]8), Strasbourg, August 29, 1979. Same author, Drawing up of an Analysis Framework for Rules of Various Kinds in the Field of Data Processing Management, Council of Europe (CJ-PD[82]19), Strasbourg, September 17, 1982. Let us also remember that the Council of Ministers of the same Council of Europe is the basis of the so-called Convention n° 108, which has inspired so many legislations (Council of Europe, Convention n° 108 for the Protection of Individuals with Regard to Automatic Processing of Personal Data. Strasbourg, 1981).

⁶ Council of Europe, Convention n° 108 for the Protection of Individuals with Regard to Automatic Processing of Personal Data, Convention opened for signature on January 28, 1981. Strasbourg, 1981.

⁷ See the list of these countries as published, for instance, in: *Moniteur Belge*, 30.12.1993, p. 29030, following the official publication of the 'Loi du 17 juin 1991 portant approbation de la Convention pour la protection des personnes à l'égard du traitement automatisé des données à caractère personnel, faite à Strasbourg le 28 janvier 1981'.

⁸ We refer here to the 'OECD Informatics Studies', which are replaced, since 1979, by the series 'Information, Computer and Communications Policy'. For the protection of personal data, see: OECD, 'Guidelines for the Protection of Privacy and Transborder Flows of Personal Data', Paris, 1981.

⁹ See Jan HOLVAST, *Codes of Ethics: Discussion paper*, in this book.

¹⁰ Questions raised by Herbert BURKERT, The Ethics of Computing ?, in: *The Information Society: Evolving Landscapes. Report from Namur*, J. BERLEUR, A. CLEMENT, T.R.H. SIZER & D. WHITEHOUSE, editors, An IFIP-WG9.2. Reader on Social Accountability of Computing and Telecommunication, Springer Verlag New York-Heidelberg & Captus University Publications, 1990, p. 5.

¹¹ See Marc MAESSCHALCK, Créer des espaces éthiques, in: *Relations*, Montréal, June 1991, pp. 143-144.

¹² Convention n° 108 and Recommendation of OECD (See notes above).

¹³ Commission of the European Communities, Amended Proposal for a Council Directive on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of Such Data, Brussels, October 15, 1992, COM(92) 422 final - SYN 287.

¹⁴ Extensive insights are expressed in François RIGAUX, *La vie privée : une liberté parmi les autres?*, Chaire Francqui 1992, Maison Larcier, éditeurs, Coll. Travaux de la Faculté de Droit de Namur, Bruxelles, 1992. We follow here Yves POULLET and Thierry LÉONARD, in their 'Afterthoughts' as explained in 'Les libertés comme fondement de la protection des données nominatives' (pp. 231-277).

¹⁵ *Ibid.*, pp. 237-238.

¹⁶ *Ibid.*, pp. 242-243.

¹⁷ Modified Proposal for the Directive of the European Parliament and the Council concerning the Protection of Personal Data and Privacy in the Context of Digital Telecommunication Networks, in particular the Integrated Services Digital Networks (ISDN) and Digital Mobile Networks, COM(94)128 final - COD 288, Journal Officiel des Communautés Européennes, No. C 200/4-18, July 22, 1994.

¹⁸ See f.i., in France, 'Loi n°78-753 du 17 juillet 1978 portant diverses mesures d'amélioration des relations entre l'administration et le public; modifiée par la loi n° 79-587 du 11 juillet 1979, Titre Ier.'

¹⁹ *IFIP Information Bulletin*, January 1994, No. 25.

²⁰ Reported in: *The Financial Post*, December 3, 1993, p. 5. See also: MARTIN, C.D. and MARTIN, D.H., Professional Codes of Conduct and Computer Ethics Education, in: *Social Science Computer Review* (8:1), pp. 96-108, Duke University Press, Spring, 1990.

²¹ Herbert MAISL, Legal Problems Connected with the Ethics of Data Processing, doc. cit.

²² For the work of the Committee of experts on Ethics of Data Processing, see Herbert MAISL, Legal Problems Connected with the Ethics of Data Processing, Study for the Council of Europe (CJ-PD[79]8, doc. cit.; Report of Working Party n° 3 on the Ethics of Data Processing (CJ-PD[80]1); Summary of a Draft Code of Conduct prepared for the Netherlands Society for Data Processing (CJ-PD-GT3[80]1); Ethics of Data Processing (CJ-PD-GT3[81]1); The Ethics of Data Processing (CJ-PD[81]5); Ethics of Data Processing, Categories and Roles in the field of Data Processing (CJ-PD-GT3[81]2 revised), Secretariat Memorandum (CJ-PD[81]8), and the last report (CJ-PD[82]19) with the Minutes of the Meeting (CJ-PD[82]31).

²³ Council of Europe, Regulations for Automated Medical Data Banks (Recommendation N° R(81)1, January 23, 1981), Protection of Personal Data for Scientific Research and Statistics (Rec. N° R(83)10, September 23, 1983), Protection of Personal Data Used for Social Security Purposes (Rec. N° R(86)1, January 23, 1986), Regulating the Use of Personal Data in the Police Sector (Rec. N° R(87)15, September 17, 1987), Protection of Personal Data Used for Employment Purposes (Rec. N° R(89)2, January 18, 1989), The Protection of Personal Data Used for Payment and Other Related Operations (Rec. n° R(90)19, September 13, 1990), Recommendation on the Communication to Third Parties of Personal Data Held by Public Bodies (Rec. N° R(91)10, September 9, 1991).

²⁴ Commission Nationale de l'Informatique et des Libertés [CNIL], *Deuxième Rapport d'activités, 1er octobre 1980 - 15 octobre 1981*, Paris, La Documentation française, 1982, p.158.

- ²⁵ Herbert MAISL, Conseil de l'Europe, protection des données personnelles et déontologie, in: *Journal de Réflexion sur l'Informatique*, no. 31, Namur (Belgium), Août 1994.
- ²⁶ Commission of the European Communities, Amended Proposal for a Council Directive on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of Such Data, SYN 287, doc. cit. pp. 109-110.
- ²⁷ Jesus Maria VAZQUEZ and Porfirio BARROSO, *Deontologia de la Informatica. Esquemas*, Madrid, Instituto de Sociologia Aplicada, 1993, pp. 94-96.
- ²⁸ The analysis which is provided, hereafter, about the different environments of the Codes show that we are facing a real 'melting pot' where no real general Guidelines can be drawn from the specific situations. Their status depends most of the time on the strength of legal recognition.
- ²⁹ See Richard SIZER, *A Brief History of Professionalism and its Relevance to IFIP*, in this book.
- ³⁰ We refer here to the analysis of G. BURREL and G. MORGAN, *Sociological Paradigms and Organisational Analysis*, Aldershot: Gower Press, 1985.
- ³¹ A Spanish idiom states that 'El derecho es el fracasso de la etica', which means 'The Law is the failure of Ethics'!
- ³² We follow here some suggestions which have been provided to us, for the purpose of this Handbook, by Marc MAESSCHALCK, PhD. They have now been published in a short paper under the title 'L'émergence actuelle de l'éthique', in: *Journal de Réflexion sur l'Informatique*, no. 31, Namur (Belgium), Août 1994, but also developed in a book: Marc MAESSCHALCK, *Pour une éthique des convictions. Religion et rationalisation du monde vécu*, Bruxelles, Publications des Facultés universitaires Saint-Louis, Coll. Philosophie, 1994.
- ³³ Jurgen HABERMAS, *Après Marx*, Paris, Fayard, 1985, p. 68.
- ³⁴ Ph. VAN PARIJS, *Qu'est-ce qu'une société juste?*, Paris, Ed. Seuil, 1991, p. 37. The author refers to John RAWLS, *A Theory of Justice*, Oxford: Oxford University Press, 1972.
- ³⁵ See its impact on the way of thinking, or on the youth behaviour.
- ³⁶ Joseph WEIZENBAUM, 'Against the Imperialism of Instrumental Reason', Chapter 10 of *Computer Power and Human Reason. From Judgment To Calculation*, W.H. Freeman and Cy, 1976, pp. 268-270.
- ³⁷ The FAST II Programme (1984-1987). *Results and Recommendations. Vol. 1 Science, Technology and Society. European Priorities. A synthesis Report*. Commission of the European Communities, Directorate-General Science, Research and Development, Programme Forecasting and Assessment in Science and Technology (FAST), Brussels, December 1988.
- ³⁸ Donn B. PARKER, Susan SWOPE, and Bruce N. BAKER, *Ethical Conflicts in Information and Computer Science, Technology and Business*, [Final Report (SRI Project 2609). SRI International, 1988]. Wellesley, Mass. : QED Information Sciences, 1990, 214 p.
- ³⁹ ABSHIRE, Gary M., *Ethics, Society, and Computers: A Bibliography*, Lafayette, Louisiana, University of South-Western Louisiana, Computer Science Department, Report 77-8-1, 26 August 1977, 44 pp.
- ⁴⁰ R. SIZER, L. YNGSTRÖM, H. KASPERSEN and S. FISCHER-HÜBNER, eds, *Security and Control of Information Technology in Society*, Proceedings of the IFIP-WG9.6 Working Conference on board M/S Ilich and ashore at St. Petersburg, Russia, 12-17 August, 1993. IFIP Transactions A-43, North-Holland, 1994, 234 p.
- ⁴¹ *FAST Research 1989-90, Major Conclusions and Recommendations for the RTD Community Policy*, Working Document presented to the CREST Meeting (October 24-25, 1991), Brussels European Community, September 19, 1991, Doc. RP/91.
- ⁴² See, for instance, J. CONDE, M.J. PARAISO and V.K. AYASSOU, *The Integrated Approach to Rural Development, Health and Population*, Paris, OECD, 1975.
- ⁴³ When the opposite is not explicitly said, the word 'codes' will be used in this study with a generic meaning, including standards and guidelines.

- ⁴⁴ ANDERSON, R.E. et al., 'Using the New ACM Code of Ethics in Decision Making', in: *Communications of the ACM*, Vol. 36, No. 2, February 1993, p. 98. *We underline*. The term 'code of ethics' is used *sensu lato* in all this quotation.
- ⁴⁵ GRITZALIS, D., TOMARAS, A., KATSIKAS & KEKLOKOGLOU, J., Medical Data protection: A Proposal for a Deontology Code, *Journal of Medical Systems*, Vol. 14, no. 6, pp. 375-386, 1990.
- ⁴⁶ One may also refer to the thematic grid which is proposed by Martin, C.D. and Martin, D.H. 'Professional Codes of Conduct and Computer Ethics Education.' *Social Science Computer Review* (8:1), p. 96-108, Duke University Press, Spring, 1990.
- ⁴⁷ R. SIZER, 'Comments on BCS and CSZ Codes', in this book.
- ⁴⁸ WHITEHOUSE, D., Comments on CIPS Code, in this book.
- ⁴⁹ R. SIZER, 'Comments on BCS and CSZ Codes', in this book.
- ⁵⁰ Ibid.
- ⁵¹ Ibid.
- ⁵² Cf. 'The BCS is about raising people quality which leads to better systems which brings business benefits.', Booklet issued by The British Computer Society (1A8/SCM/9/90).