Editorial

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The digital revolution poses complex questions to all of us and especially to teachers of schools of all levels, researchers, professionals, universities, ICT companies, policymakers and our society in general. From the e-democracy to the e-inclusion, from the digital divide to the new forms of slavery in the network, from the web titans to the open access, from the hackers of free hardware and of free software to the end of privacy, from the cyber war to the robotwarriors, from the unreliability of the software to the environmental impact of ICT, from the cloud computing to the bigdata ... these are all issues that now pervade our daily lives and that require the initiation of a broad debate among the various stakeholders.

Monday, November 18, 2013 it was organized by AICA and the Nexa Center a day of study at the Polytechnic of Turin on the theme: "Computer ethics: social and ethical aspects of the digital revolution" that wanted to explore the theme of computer ethics by addressing the questions: what role they can play the academic institutions? How to prepare the new generations of computer scientists to address these ethical dilemmas? What role can they play the professional associations of computer scientists? How the "computer ethics" evolves in the light of the current information revolution?

Distinguished professors in the field brought their contributions:

- Simon Rogerson of De Montfort University with a speech on "Participative Learning delivers Computer Ethics: how to prepare future computer professionals"
- Declan Brady of the Council of European Professional Informatics Societies (CEPIS), with a presentation on "Ethics: IT Professional pillar or pillory"
- Victoria Nash of Oxford University with a contribution on: "Moulding citizens and structuring states: the hidden politics of information technology"
- Luciano Floridi at Oxford University with a speech on: "Information, Justice and Tolerance: the unstable triangle"

They were followed by a panel discussion attended by Bruno Lamborghini, Juan Carlos De Martin, Norberto Patrignani, Angelo Raffaele Meo, Franca D'Agostini, Massimo Durante, who has discussed the issue with particular regard to how our universities can give their contribution to teaching and research in the field and

the opportunity that the associations who are interested in digital technologies take steps to draw up a code of ethics for professionals and companies in the sector, as it has done in other areas of technology.

AICA has organized a working group dedicated to the Computer Ethics, under which was also organized this day of study at the Polytechnic of Turin; it promotes various initiatives to draw the attention of teachers and IT professionals on social and ethical issues of digital technologies. Among these should be mentioned the annual announcements for awards for thesis or doctoral dissertation dedicated to this sector, organized in collaboration with the Italian Districts of Rotary International; the objective is to encourage the study of Computer Ethics at our Universities, in particular, to draw students' attention on the topic, both at the Humanities Faculty at both scientific ones. The success achieved so far in terms of competitors bodes well.

This issue of Mondo Digitale reports what has been illustrated and discussed in the meeting in Turin, in the belief that it has an interest of its readers and hope that the goal of a greater attention of our universities and practitioners in the field of digital technologies for the field of Computer Ethics can be successfully pursued in the short term. It also added to a proposed "Code of Ethics" dedicated to those who work in the field of digital technologies on the track of what has been done in other European countries, as indicated by CEPIS, of which AICA is a member, with the aim of eliciting an in-depth discussion on the topic and quickly come to a shared proposal.

Ethics: IT Professional Pillar or Pillory

D. Brady

Abstract. *This article proposes that, since the ubiquity of IT gives it a unique capacity for both benefit and harm, Ethics has a more visible role to play in IT as a maturing profession. The questions which are posed by failures of – and caused by – IT are increasingly of a nature that many IT professionals can find themselves ill-equipped to answer; this is the domain of Ethics. IT Professionals demonstrates their commitment to incorporating ethical considerations into projects through adhering to a Code of Ethics; it is important that such codes, and our commitments to ethical standards, have real practical value, lest they be seen as more of a pillory than a pillar of the profession.*

Keywords: Professionalism, IT Profession, Ethics, Code of Ethcis, Standards, Best Practice

Introduction

First, let me put my cards on the table. I am not an expert in Ethics, the study of Ethics, or the application of ethical considerations to any particular domain. Instead, I consider myself to be an IT professional with a strong – possibly selfish – interest in Ethics; how Ethics applies to my work, as an IT practitioner, and how Ethics needs to be considered as an increasingly important facet of the profession in which I work.

Rather than attempt to present a scholarly paper on Ethics, therefore, what I'm going to do in this article is talk a little about where all this talk of Ethics comes from (from an IT perspective), what CEPIS' perspective is (*see sidebar 3*), and also pose some questions; some of which may have answers, and some not. I'm also seeking your support and input into our consideration of these questions.

My interest is specifically about *Professional Ethics*; not the philosophically derived questions of Ethics, but the pragmatic and practical inclusion of Ethics and ethical considerations in the day-to-day practice of the IT Professional, and as a construct within the IT Profession (e.g. as Codes of Ethics).

I've taken "Pillar or Pillory" as my title (*see sidebar 1*), because I think it helps to visualise a key aspect of this important area. Ethics, as we shall see, is considered one of the key *pillars* of any profession, and therefore of the IT

Profession. In establishing, using, and publicising codes of Ethics, Professional Societies can show the value that they add to society. At the same time, we need to ensure that our Professional Ethics does not become used as a kind of *pillory*, either for the profession itself, or for individual members of the profession.

Why professionalism/Ethics etc?

We are surrounded by ethical conundrums. I have been in IT for nearly thirty years, in one role or another – first as a student, then later as a practitioner (and, later, student again) – and I've witnessed an enormous amount of change. As a society we've become very used to the idea that IT is changing our landscape very quickly, to the extent that in recent times we are facing questions that 20 years ago we would not have thought could possibly arise; indeed, not even twenty years ago, but last year, or last month, or last week, or even yesterday.

Who would have thought, twenty years ago, that we would have to worry about "unliking" people on Facebook? Who would have thought, twenty years ago, as the internet was beginning to crystallise into something useful, that we'd need to think about things like the intellectual property of the music industry or the film industry, or the software industry itself, and of open source? Who would have thought, only five years ago, that we would have to start worrying about digital property after death? (Who owns my iTunes library? At the moment it turns out that I don't, I'm only borrowing it until I die, even though I've paid for it). More recently, Facebook has changed its default approach to privacy for those people lucky enough to be under the age of 18, and this raises new questions for society too. There is so much going on, and that rapid change is outpacing the capacity of governments, and of regulators, etc. to actually deal with it from a legal perspective – let alone IT practitioners, or even members of the public.

Michael McFarland, SJ at Santa Clara University (McFarland, 2012), refers to the "human cost of computer errors" for which we can read, really, system errors, process errors, and so on: Incorrect data in credit histories or criminal databases, incomplete data, incorrect or inappropriate processing etc. – people denied credit, forced to change plans, denied appropriate medical care, deprived of their liberty, through errors in IT systems.

Another thing that we have to face now, as a community of IT, is the fact that while 20 years ago IT was a box that sat in the corner humming away with flashing lights and whirring tapes, now it's on the streets, in people's phones and hands, it's very much in the consumer domain, and that, of course, creates a wide range of different questions that we have to consider.

This is why we need to talk about Professional Ethics. Ethics has, in fact, been a consideration among IT practitioners for a long long time, certainly from a human perspective (in which considerations of ethical behaviour applies to everyone), and more lately, as our IT-driven technological revolution has driven us ever faster into areas that our natural ethical thinking has not altogether left us best equipped to consider. At CEPIS, we have recently completed an EC funded project together with the Innovation Value Institute (at Maynooth in Ireland), entitled "*e-Skills and ICT Professionalism: Fostering the ICT Profession in*

Europe" (the output from this can be seen on the CEPIS website at http://www.cepis.org/professionalism (McLoughlin et al., 2012)).

One of the things that this project set out to do was to establish some of the groundwork for a framework to support the concept of an IT Profession as a peer of the established professions (such as law, medicine, and so on). An important output of this was to create a clear, understandable and hopefully universally acceptable description of what an IT Professional is, as this had not existed in any kind of universally agreed sense before (*see sidebar 2*). This definition drew on the widely accepted understanding of what it means to be a professional, both from a practitioner's perspective, and from a consumer's point of view, and applied it to the realm of IT.

This definition makes it clear that an IT Professional (indeed, any Professional) is someone who agrees to adhere to an *agreed code of ethics*. This puts ethics centre-stage in any discussion of professionalism and what it means to be a professional. So from that perspective, we now need to be able to talk about what "adhering to an agreed code of ethics" actually means in practice. This means that we need to first of all be able to explain to ourselves what this means, and then be able to explain to members of the public (the *Software Engineering Code of Ethics* says that the first obligation is to the public (ACM, 1999)) what it is that our IT Professional Ethics is, and what it means to them.

Figure 1
Corporate Ethics (source drdianehamilton.wordpress.com)

Let's, for a moment, go back a step, and ensure that we agree why we need to be asking these questions. I don't mean to pick on Google, but this image couldn't help but catch my eye during my research for this topic! We all know that the "mantra" of Google has been "do no evil", and we might also know that for a short period in the fairly recent past Google employed a "Chief Ethics Officer" – a CEO of a different kind; however, many of us, of late, following things like Google's capture of personal data when they were looking for Wi-Fi codes

while compiling Street View, and things like the Google car, and Google Glass, might be wondering whether or not, in the public eye, the Google Ethics Department comes from a similar mould to Ryanair's fabled Customer Care.

The first thought that this prompts is that, much more often than not, questions of Ethics arise typically when our personal sense of Ethics is *offended*; how dare Google sniff at my personal data (never mind that I didn't encrypt it)!

The second thought which comes to mind is that Ethics is *relative* – at least, in the absence of any agreed standard, it is often a matter of personal perspective. We all have our personal perspective on what is right and proper, and what is not, and these are typically culturally informed, rather than absolute. How, as a consumer, am I to approach trusting you, as an IT practitioner, to undertake something on my behalf, when I know that our perspectives are different?

"A defining aspect of any profession involves adhering to professional ethical conduct. Assuming ICT is to mature as a profession in the same way as many other professions, the need for professional ethics in ICT is paramount, particularly considering the pervasive nature of ICT on individuals lives and issues such as privacy, security, equity of access and so on."

Whether or not particular situations or concerns are right or wrong in any kind of absolute moral sense, in order to have a reasoned discussion we need to ensure that we all understand an agreed perspective from which to have that discussion, so that relative and personal perspectives are removed.

Need for IT professional Ethics

Of course I'm talking, quite specifically, about *Professional Ethics*, rather than the wider, more philosophical question, of Ethics *per se.* The *e-Skills and ICT Professionalism* project referred to earlier notes that a defining characteristic of a profession is "adherence to a code of ethics or conduct"; and that this is there to make us compatible with other professions, which have long standing statements on Ethics.

A question we need to ask is whether IT Professional Ethics is different from other ethics (in scope, in questions to be considered, in the extent of its reach), and is IT Ethics different from Professional Ethics (per se), and is the Ethics that a web designer needs to be familiar with different from the ethics that a system designer of automated drones needs to be familiar with? And the answer to those is probable both yes, and no, and it's far too early to say, in any event, what those things might look at.

So what do we think ethics is anyway?

So, what exactly *is* Ethics? Far be it from me, as a self-professed non-expert, to try and pin this down! However, it is important that when we are discussing a topic, we should at least try to agree on what we mean by the topic. So I'll give you my take on the meaning, and you can compare that with your own, and then we can see how the conversation progresses from there!

Ethics is often described as “telling right from wrong”; going as far back as the philosophy of ancient Greece, it’s “how best we live” (cf BBC, 2013). My favoured description of Ethics, however, comes from CIMA, where (with apologies to discussions on the closely related area of *integrity*) following an ethical code is described as “doing the right thing *even when nobody else is looking*”.

The idea of doing something a particular way, even if nobody else is looking, takes us a little bit away from the pillory, of course; with the threat of the pillory, Ethics is only *doing the right thing under the threat of having vegetables thrown at us*! But what we aspire to, of course, is that we are going to do the right thing not because of the threat, but *despite* that threat.

We also need to look at the question of Ethics in relation to its context; my Ethics (in the absence of subscribing to a formal code) is going to be different from your ethics – maybe not in its gross sense, but certainly in some of the particulars. I come from Ireland, and if we take medical Ethics as an example, in Ireland it is the case that it is very difficult to obtain an abortion (a very difficult subject), and it is very tightly regulated; whereas in some other countries medical Ethics tends to regard abortion is a treatment; While you can disagree or agree with that from an Ethical perspective, the point that it illustrates is that even in the area of something as mature as medical Ethics, which has developed over a very long time, we don’t have to go too far to find that there are Ethical differences.

My own view – and maybe I’ll be slightly controversial here –is that Ethics is what we use to be able *to predict how other people will behave*. It’s easy enough to establish when someone has broken the law; it’s much harder to be able to pin down that someone has actually done something wrong – Ethics is a bit more blurry than the law (and often not entirely consistent with it). One of the interesting things when we consider Ethics is that we tend to be more outraged when someone has violated our personal sense of Ethics, than when somebody has actually broken the law. We’re all willing to forgive someone crossing the road at a red pedestrian light (in most places, that’s against the law, but is it *wrong* when there’s no traffic?); however, when somebody takes money from the charity box, we regard that as very bad.

What’s going on here, of course, is that someone has failed to live up to our expectation of how they will behave in that situation. This is a clear area where the concept of a code of Ethics is understood; when a professional body publishes or promotes a professional code of conduct or Ethics that it expects its members to obey, its purpose is really to declare a standard of behaviour, and a mode of working, that the public should expect from its members; i.e. it’s there to give the public, and customers, the means of predicting how a member of that society will do their work, creating an expectation of quality and confidence in that work.

Analysis of prior ethics initiatives

One of the strands of CEPIS' e-Skills and ICT Professionalism project was to take a close look at Ethics, because Ethics is such an important part of professionalization. The project discerned that there are three areas of concern which arise when looking at Ethics:

- The first is whether or not it's possible for there to be a universal code of ethics? I've already alluded to the fact that we don't have to travel too far to find situations where the ethical outlook is quite different to our own; these differences are usually culturally, religiously, or politically derived. Could a universal code of Ethics, specific to a particular domain, transcend this?
- The next was about what should actually be included in our Ethics? What sorts of issues should we be talking about, and preparing IT Professionals to address? What sorts of situations should we be putting in our Ethics to illustrate the kinds of choices that IT Professionals should make?
- And the third brings us to the *pillory*; this is the issue of sanctions; in other words, what and how to manage situations where the code of Ethics has been contravened.

Let's consider each of these in turn.

Whose ethics

Let's first look at the question of whose ethics? i.e. who is it that decides what our Ethics should say? Ethics, as we've seen, is a bit like beauty: it depends on where you're standing – it can depend very much on who's doing the beholding, and on what's being beheld.

There are very many large employers, for example, that have their own codes of ethics (Hamilton, 2011): Amazon has one, IBM has one, I've no doubt that the Politecnico di Torino has one that it expects its students to obey. One of the interesting things to discover was that there's no agreement on what ethical codes should look like, no agreement on how they should be expressed, and no agreement on the nature of the things that should be in them (ILO, 2012). This makes looking at Ethics, particularly the comparison of Ethics, a bit of a conundrum for us, because they can be interpreted in different ways.

The fact that there are many different codes of Ethics itself raises another challenge. If I take myself as an example, in examining the question of "whose ethics" – I'm a relatively complicated person: I wear many different hats. I am, at the same time, a member of the British Computer Society, and a Fellow of the Irish Computer Society; both of those organisations have their own codes of ethics. I was for a long time an employee of a large Japanese multinational, and it had its own code of ethics. From time to time, that organisation would send me to go and work with client organisations as a consultant, and of course when you

go to work in other organisations you are expected to adhere to *their* codes of ethics. This creates a challenge for the practitioner, because now you've got four different codes of ethics washing around inside mind as you try to figure out which one of those codes of Ethics is supposed to apply in any given circumstance. Our professional system of Ethics needs to be able to accommodate the overlap with other Ethics systems, without conflicting the practitioner unduly.

While whose code of ethics is a challenge, in actual fact, from my perspective (if I put my hat as the chair of the Professionalism Task Force in CEPIS back on) what I'm actually talking about is our code of ethics – in other words, the body of professionals. It is in our own interest to pay attention to this, because the code of Ethics tells us how we expect others to behave. When we admit people into a professional institution, it is important for both upholding the standing of that institution and its members, and for the benefit of public understanding, that we're able to describe clearly what can be expected from any of its members. In a sense we're saying "here's how you're going to behave and you're going to behave this way because it is the right thing to do, and because it also reflects well on the society that we are a member of, and because I'm also a member of that society, it reflects well on me, and I don't want to be blackened if you misbehave", and we say this in a very public way. So it's our code of ethics, and because of that one of the things that we have to do as professionals is to sit down together and figure out what does that mean for us, and we have to brave in doing that because quite often when we look at codes of Ethics what we are really looking at are somebody else's Ethics – the codes of Ethics that have been written not by us, but by the directors, or the board, or the advisory panel, or the committee, not by the actual members, and that is an ethical challenge, perhaps, in its own right.

What ethics?

The next issue then, is "what ethics" – what needs to be included. There has been quite a lot of work down the years looking at Ethics – there are things like the *Toronto Resolution*, the *Computer Ethics Institute's "ten commandments*"; there is work done by IFIP; there is the *software engineering code of ethics (*now part of an ISO/IEC standard); and so on. There are lots of things there, but they're all very particular, some of them are relatively old, none have universal acceptance, and yet here we are in 2014, with new challenges that could not even have been considered then. The question of "what ethics" is one that we have to be continually asking, and that will mean continually asking ourselves some challenging questions.

Naturally we all say, much like the Software Engineering Code of ethics, that we must have a "first do no harm" clause – the IT equivalent of a Hippocratic Oath; and because ethics mostly arises from the potential that harm might be caused, we need to ask things like (cf SEE, (ND)):

- How software engineers contribute to the good life for others;
- Who exactly are the 'public' to whom the engineer is obligated;

- Why the software engineer is obligated to protect the public.
- And we then need to consider some subsidiary questions:
- What other ethical obligations software engineers are under;
- How software engineers can actually live up to ethical standards;
- What is the end goal of an ethical life in software engineering;
- What are the professional codes of software engineering ethics.

If, once again, I put all my hats back on (the Irish Computer Society, my employer, my client, and so on), to whom, exactly, am I ethically obliged? Is it my employer? Is it my client? Is it my immediate manager, who has given me a set of requirements to follow? Is it the customer of my customer, who's going to be using the product? And so on? Where does the boundary of my ethical commitment actually lie? And how can I possibly accommodate all of these questions in my consideration in the small amount of time available to me? How do I eliminate the risk of ethically induced paralysis due to the fear that someone is going to throw vegetables at me?

What remit?

And then there is the remit of ethics. By remit, I mean its boundaries, its extent, how far out do we extend its reach – where, exactly, can I stop having to think about it?

According to the Taskforce on Professionalism, Ethics outlines the boundaries of relationships with customers, colleagues and society (CEPIS, 2010). Hence, ethical guidelines and principles are applicable at different levels. There is an internal dimension focused on ethical conduct within the organisation and amongst colleagues or other professionals involved in ICT; and there is also an external dimension concerned with the impact of the organisation's work on society at large and within the organisation's sector or industry.

Figure 2
Google Car (source - Google)

Again, I'm not picking on Google, but it's a really good image: this is the *Google Car*. As no doubt you know, the Google Car is a car that is driven not by a human driver, but by a piece of software; a piece of software that some very clever software engineers have written. But this machine goes out onto the public road on its own, so what are the ethical considerations of the Google Car? Let me put that more concretely – while there is a growing body of scientific evidence which shows that many of the advanced technologies used in the Google Car (and, indeed, in many production cars) actually serve to improve road safety and economy, what happens when a self-driving kills somebody? Whose responsibility is that? Is it the owner of the car? Is it the passenger of the car (since there's no driver)? Is it the fault of the person who got killed? Is it the manufacturer of the car? Is it Google? Is it the software engineers? This quickly begins to take on an air akin to the that of the position of the National Rifle Association in America: their argument is that it's not guns that kill people, it's people that kill people. While the philosophy of that standpoint is undoubtedly true, it's not in fact helpful when someone is unfortunately lying dead on the street.

One of the things, then, that we have to be conscious of in our thinking is that IT Professional Ethics have *indirect consequence for us*; in other professions they are much more direct – if I am the surgeon operating on a patient, my ethical question is *now*, my ethical question is *the patient*. With IT systems it's a little bit different, because IT, as we know, often has *emergent* consequences; things that we never dreamt of when we were writing it. So how can we forewarn ourselves and consider the Ethics of things that may not yet have emerged? How can we change the situation, for example, that if the accounting system is broken, it's not the programmer that gets fired, but it's the accountant that gets fired. We need to concern ourselves with these sorts of things. So what remit? To whom is the individual IT Professional responsible? Their boss? Their customer? The end user? All of them, indeed, at the same time, but in different ways, need to be considered.

What about sanctions?

Last, we must consider sanction. In 2000, ABET (the US organisation that accredits US University Schools of Engineering programmes) began to require the study of ethics in all accredited engineering programmes. Professional engineers today, then, (at least in the US) are expected to both learn about and live up to ethical standards as a condition of their being included in the profession. But what happens *if they don't?* There are many codes of ethics, but there are relatively few active disciplinary committees. What becomes of the meaning and value of a professional society's code of ethics if it is not applied? Does it become a pillory, not for the member, but for the institution itself? Is it a humiliation that we will put up a code of ethics, but either have no means of making it have actual meaning, of giving it value to society, or that we decline to do so? As stated by Lee and Berleur (1994) "*codes, like laws, tend to keep the honest persons honest and have little impact on those who chose to ignore their precepts or who have never been exposed to their tenets*."

The danger, here, is that the IT profession, in talking about and publicising Ethics, puts itself on a pedestal.

Pillory

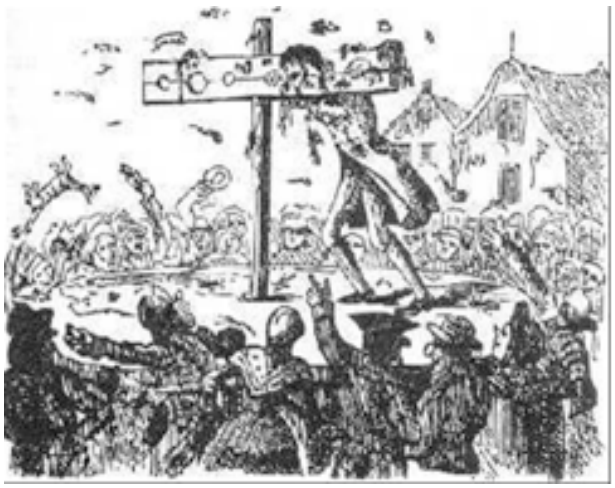

Figure 3
18th century Pillory - Source: Wikipedia

The word “pillory” is first recorded in use in the English language in 1274, and is thought to come from Old French “pilori”, and then from Latin “pilorium”, where the original meaning of the word refers to a pillar. In mediaeval Europe, victims requiring punishment were typically tied or shackled to a stone (or sometimes, wooden) pillar, where they could then be whipped or subjected to other forms of physical chastisement.

The more recent view of the pillory, in use in England until the mid-nineteenth century, is more closely related to a village stocks (see picture). This locked the victim in, either by the hands and neck, or by the feet. It was used predominantly as a local, village-based, means of imposing punishment, and its intent was typically to humiliate rather than harm (though cases of harm, and sometimes even death, were not unknown). Stocks also served as a kind of village entertainment, with local people gathering to see who was being punished, and engaging in themselves in both the entertainment and the humiliating punishment through throwing fruit and vegetable waste at the victim. The verbalisation of pillory, meaning to expose to public scorn or ridicule (as in “to pillory a victim”), dates back to 1600.

The humiliation of punishment by pillory typically cost the victim the loss of his or her livelihood, at least for a period of time, and it is this aspect which makes for a good analogy for the discussion of professional ethics.

(Sources of Information: en.wikipedia.org/wiki/Pillory; dictionary.reference.com/browse/pillory?s=t)

Definition of IT Professionalism

ICT Professionals

- Possess a comprehensive and up-to-date understanding of a relevant body of knowledge[1]
- Demonstrate on-going commitment to professional development[2] via an appropriate combination of qualifications, certifications, work experience, non-formal and/or informal education;
- Adhere to an agreed code of ethics/conduct[3] and/or applicable regulatory practices and,
- Through competent practice[4] deliver value for stakeholders.

[1]. The term relevant body of knowledge encompasses the requirement for a broad and deep knowledge base which is up-to-date, accommodating both a common ICT body of knowledge, and pertinent specialist knowledge and skills.
[2]. Professional development focuses on improving professional competence in a professional role, with the objective of enhancing personal performance and career progression opportunities. It can encompass both technical aspects (e.g. keeping abreast of latest technological trends) as well as non-technical aspects (e.g. developing better presentation skills).
[3]. Professionals are accountable to themselves, the ICT Profession and society, through an agreed code of ethics/conduct or applicable regulatory practices.
[4]. Competent practice communicates the concept of quality of products and services being delivered by practitioners.

CEPIS, Professionalism and Ethics

Why is CEPIS spending so much energy on Professionalism?

Professionalism was one of three key strategic areas which the Presidents of the CEPIS member societies, gathered at a key strategy meeting in Vienna in 2006, wanted CEPIS to concentrate on (this has since expanded to five thematic areas: Professionalism and skills; Education; Women in ICT; Green ICT; and Legal and Security Issues).

The motivation behind this strategic thinking mirrors much of the discussion in the main article. Specifically cited factors include:

- Higher quality and reliability
- greater security
- more accountability
- higher value services
- Innovation and agility
- delivering business benefit

These are very current discussion themes, and will be key drivers behind IT professionalisation in the coming years. It is interesting to note that none of these factors are about technology, but are about how and by whom technology is applied to business problems.

One thing we have learnt in CEPIS (spanning, as it does, almost the entire European continent from the Baltics to the Balearics, from the Aegean to the Atlantic), is that Europe is not a homogeneous space. All European societies understand the underlying elements of Professionalism, but through different cultures, priorities, histories and even legal systems express these ideas in different ways (one significant axis being, for example, that which divides the Chartered model from the Academic model).

CEPIS established a programme which first sought to understand these different views and to draw out a set of characteristics which Professionalism has in common across Europe (http://www.cepis.org/professionalism). These characteristics could then be used to create a mutually acceptable language against which different countries/regions/member societies can align (cf Brady, 2009).

More recently, CEPIS has gathered together the Codes of Ethics and Codes of Conduct of its member societies (http://www.cepis.org/ethics). This has allowed us to start to draw a clear distinction between Codes of Ethics and Codes of Conduct; these are often conflated, while in reality they are quite different things.

Please join our discussion at http://www.linkedin.com/groups/ICT-Professionalism-4801766.

Conclusion

I said at the outset that, not being an expert in Ethics, I was going to set some perspective and pose some questions. Ethics is a key *pillar* of any profession; because of IT's ubiquity, and therefore its near unique capacity to create both benefit and harm, Ethics has perhaps a more visible role to play in IT as a maturing profession.

This is the information age; IT has helped propel society forward, helped develop our economies, helped to create wealth and opportunity. But at the same time, it has created its own failures, contributed to disasters, and caused us to pose many questions that we find ourselves ill-equipped to answer. These are the domain of Ethics.

The IT Professional's commitment to Ethics can be demonstrated by measuring their professional practice against an agreed standard of ethical behaviour – a Code of Ethics. The aim, of course, is to produce high quality results through the best use of the knowledge, competencies and resources available.

However, in taking this approach, we need to ensure that our Codes of Ethics, and our commitments to ethical standards, have real practical value, both to the public, and to our institutions, lest they become seen as more of a pillory than a pillar.

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Biography

Declan Brady is an IT professional of more than 25 years standing. Declan graduated with Distinction in Computer Science from the Dublin Institute of Technology; he holds M.Sc.s from Dublin City University in Computer Applications and, most recently, from the National University of Ireland in IT Management. His career has spanned many roles and responsibilities, including software development, solution architecture, database management, IT Services and CTO.

Declan represents the Irish Computer Society to CEPIS since 2002. He currently holds the office of Honorary Secretary at CEPIS, and is Chair of the CEPIS IT Professionalism Task Force.

Declan is a Fellow of the Irish Computer Society, a member of the Association of Data Protection Officers, and a Chartered IT Professional. He is currently working in Software Quality.

Preparing IT Professionals of the Future

S. Rogerson

Abstract. *The underlying aim that should be instilled in future IT professionals is to deliver fit-for-purpose systems which accommodate recipients' needs rather than recipients having to adapt to systems. Those entering the IT profession today are faced with a plethora of application areas using a vast array of technological armoury. The responsibilities of young IT professionals and their obligations to society are onerous. Yet it is uncertain how well they are prepared for such challenges and whether they have been educated to understand that they are the custodians of the most powerful and flexible technology mankind has invented. This paper discusses the type of challenge to be faced; the practical tools that might be used in addressing such challenges and the style of educational preparation that could be used. The aim is to provide the stimulus to rethink the manner in which we should prepare IT professionals of the future.*

Keywords: Ethics, Experiential Learning, IT Professionals, Professional Responsibility

1. Introduction and motivation

J. Lyons & Co. was renowned throughout the UK for its fine teas and cakes which were mainly sold through its chain of more than two hundred high street cafés. In 1951, it built and programmed its own computer, LEO which was used to manage the daily restocking of the Lyons tea shops [Ferry, 2003]. It was the first computer to be used for business data processing. In many respects this commercialisation of computing heralded the beginning of the IT profession which today spans the world in terms of application reach and social impact.

As a young graduate, I entered the IT profession in 1972. It was well established as a vital corporate resource but it was still a back-office function. Fast forward to 2014 and we find that IT pervades almost every human activity. It no longer is restricted to scientific or commercial endeavour that typified the era in which I joined the profession. It is a far cry from 63 years ago and the age of LEO. Those entering the IT profession today are faced with a plethora of application areas using a vast array of technological armoury. Not only that but IT has been democratised to the extent that many applications are built by non-IT

professionals. The responsibilities of young IT professionals and their obligations to society are onerous. Yet it is uncertain how well they are prepared for such challenges and whether they have been educated to understand that they are the custodians of the most powerful and flexible technology mankind has invented.

The commercialisation of IT is not without its problems. To see IT as a powerful corporate resource simply to facilitate the prosperity of the organisation is wrong. Unfortunately this perspective is commonplace. For example, the *2012 Cost of Cyber Crime Study* published by the Ponemon Institute [p24, 2012] uses two separate cost streams to measure the total cybercrime cost for each participating organisation. These streams relate to internal security-related activities and the external consequences experienced by organisations after suffering an attack. The report fails to recognise the societal cost of cybercrime in terms of society at large or individuals directly or indirectly affected. A second example concerns SAS, a leader in business analytics software and services, and the largest independent vendor in the business intelligence market. On its website [SAS, 2014] it states, “and big data may be as important to business – and society – as the Internet has become. Why? More data may lead to more accurate analyses. More accurate analyses may lead to more confident decision making. And better decisions can mean greater operational efficiencies, cost reductions and reduced risk.” Again the focus is very much on commercial wellbeing with only a passing remark about society. These two examples are indicative of the sort of emphasis given to IT potential or worth. There appears to be imbalance in this emphasis.

However, there are some hopeful signs of a more balanced view being adopted by some. Here are just two examples. The winner of the 2012 Australian Government ICT Young Professional of the Year Award, Christopher Giffard from the Department of Education, Employment and Workplace Relations, was quoted as saying in his acceptance speech, “It is my hope that the award will draw attention to the importance of accessibility and standards on the web, both for multimedia and for general web content, and the obligation that our industry has to ensure equal access for all Australians to information services and technology”[ACS, 2012]. In India, the Al-Ameen Movement helps in the education of the young in the socially and economically deprived sections of the society in the region of Bangalore. As part of this, the Al-Ameen Institute of Information Studies prepares the youth of today to become future IT professionals. Its Principal explains, “Students are entrusted to our care for integrated development which includes technical, moral, physical and spiritual development, besides imparting knowledge in their disciplines. We at Al-Ameen nurture them … to develop into confident, proactive and ethical young IT professionals ready to take up the corporate challenges in the international arena.” [AISS]

This paper discusses the type of challenge to be faced; the practical tools that might be used in addressing such challenges and the style of educational preparation that could be used. The aim is to provide the stimulus to rethink the manner in which we should prepare IT professionals of the future.

2 Issues to address

The underlying aim that should be instilled in future IT professionals is to deliver fit-for-purpose systems which accommodate recipients' needs rather than recipients having to adapt to systems. They should be encouraged to move away from the traditional view of 'one solution fits all' to the view that 'one solution is no solution'. Rights, justice, care and empathy should pervade practice. The IT environment should be considered through two lenses; relationships and timeframes. This will have an impact on the manner in which IT is developed and implemented as illustrated by the Big Data example at the end of this section.

IT Relationship Trinity

The first lens is a high level issue which focuses on the actual delivery of IT. The identification, development and use of IT occur within a set of interrelated entities. These entities can be categorised into vendor of both hardware and software; developer of both infrastructure and application; and recipient both direct and indirect. Direct recipients comprise clients and users whilst indirect recipients comprise individuals, the general public and society as a whole. Relationships exist between these entities and are defined as a relationship trinity as shown in Figure 1. If the trinity operates effectively then the likelihood of acceptable IT is increased. The IT relationship trinity will both be affected by and affect organisational culture, business strategy and societal norms. Relationships will be two-way between vendor and developer, developer and recipient, and recipient and vendor.

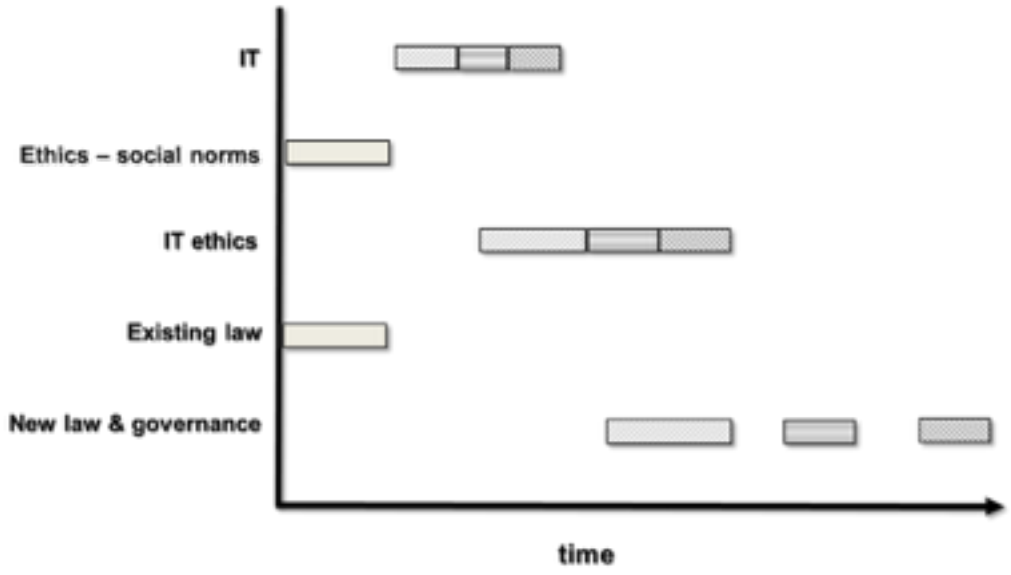

Figure 1
The IT Relationship Trinity

Trust across the IT relationship trinity is paramount. Smith [2011]explains that trust is a social relationship where 'A' trusts 'B' to do 'C. 'A' will only trust 'B' if 'A' believes 'B' to be trustworthy with respect to 'C' and for 'B' to be trustworthy requires that 'B' has both the competence and the motivation to satisfy the requirements of 'C'. Smith further suggests that trust is relational in nature and this implies that trustworthiness is but one component of a larger social relationship of trust between actors. For example, in the delivery of application software running under a graphical user interface operating system (GUI-OS), the user recipient will only trust a vendor if the recipient believes that the vendor is trustworthy with respect to GUI-OS and for the vendor to be trustworthy requires that the vendor has both the competence and the motivation to satisfy the requirements of providing a robust GUI-OS. Similarly, the recipient will only trust a developer if the recipient believes that the developer is trustworthy with respect to the application and for the developer to be trustworthy requires that the developer has both the competence and the motivation to specify and produce acceptable application software. Therefore in the larger social relationship of trust, a recipient may distrust a vendor or developer because either competence or motivation or both are lacking to deliver this new software but at the same time might trust the same vendor or developer regarding ongoing maintenance of existing software because both competence and motivation are present.

It is important that future IT professionals understand the trustworthy nature of the IT relationship trinity. This becomes increasingly important the more pervasive IT becomes. It is simply wrong to instruct future IT professionals in technological subjects alone in isolation of the complex social structure in which systems design, development and operation exist.

Timelines

The second lens is a high level issue which concerns the respective timelines associated with evolving IT. This is illustrated in Figure 2. The horizontal axis represents time and the vertical axis has five separate, though interrelated, timelines.

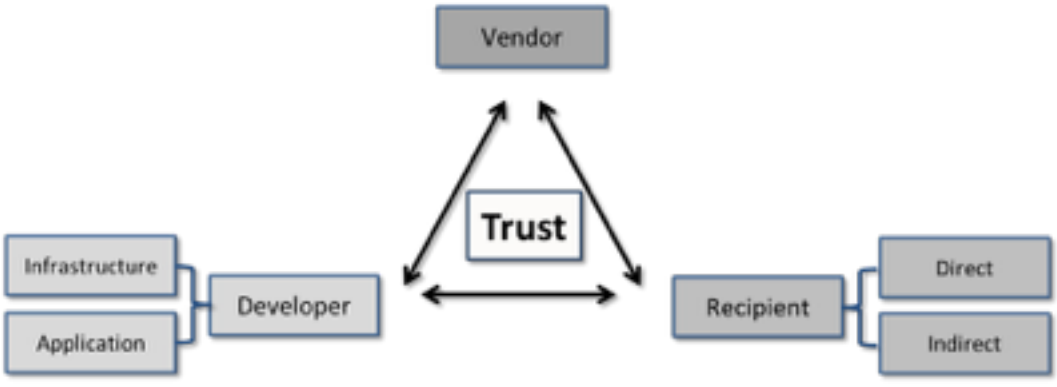

Figure 2
Respective Timelines

In the beginning there exist ethics and social norms which people subscribe to. These might change over time, but very slowly. There is existing law which provides a practical perspective of such ethics and social norms. A piece of IT is developed over a short period of time as shown in the IT timeline. This timeline has three elements representing the evolution of the piece of IT through three generations. Typically, the ethical implications of the piece of IT only come to light after the first generation is implemented. The ethical consideration continues but at slower pace than the technological evolution as illustrated in Figure 2. Indeed, it could be by the time that this consideration is concluded the IT has passed through 2 further generations. It may be that the IT requires a new or amended law or governance regulation. This legal consideration takes considerable time to bring new laws onto the statute book and for these to become operational as shown in Figure 2. By the time the law is in place the third generation IT may be well established operationally. From this discussion, it can be seen that there is a serious misalignment of timescales. As such, the piece of IT is operating for a considerable period in an IT policy vacuum. This will always be the case with evolving IT for ethical consideration will lag behind technological development and the provision of appropriate law or governance will lag even further behind. This is why there will always be a challenge for IT professionals in delivering acceptable IT. Furthermore, it is why the appropriate, balanced preparation of future IT professionals is paramount.

The advent of Big Data

Returning to 1951 and the first business data processing system, it is clear that the data collected and generated was localised, impersonal and unlikely to be shared with other systems, be they mechanised or manual. By 1972, the world had changed. Business data processing systems were commonplace. Data relating to people was being processed and generated. Systems were sharing data within single organisations. Transfer of data across organisations was limited but did exist. Concerns began to be voiced as personal data collection increased and relationships were established between data which was collected for very different purposes. These concerns grew as data was now accessible not only offline but also online. This prompted the Organisation for Economic Cooperation and Development (OECD) to publish its *Recommendations of the Council Concerning Guidelines Governing the Protection of Privacy and Trans-Border Flows of Personal Data* on 23 September 1980. Those concerned about the ethical issues surrounding the use of IT were similarly moved to publish. For example, Mason [1986] published his seminal paper in which he stated the four ethical issues of the information age: privacy, accuracy, property and accessibility (PAPA). It was not until 24 October 1995 that the European Parliament issued Directive 95/46/EC *on the protection of individuals with regard to the processing of personal data and on the free movement of such data*. “The UK Government was required to implement this Directive which it did in the form of the Data Protection Act 1998. It came into force on 1 March 2000 although some provisions did not commence until October 2007.” [The Data Protection Society].

This account illustrates the misalignment of timelines. The business data processing systems had evolved through many generations before growing

ethical concerns eventually prompted legislation to be drawn up. It took many years for this legislation to be implemented in practice. During this period of concern which lasted in the region of 15-20 years the only thing individuals had to rely on was the trustworthiness of the IT relationship trinity and there were many instances where the trinity was perceived as being untrustworthy.

There has been yet another technological shift in data processing in recent years. This is now known as Big Data. Big Data is data which is too large, complex and dynamic for any conventional data tools to capture, store, manage and analyse [WIPRO]. According to Laney [2001] Big Data is defined by three attributes; volume in terms of the large amounts of data, velocity in terms of the need to analyse large amounts of data quickly and variety in terms of the vast range of structured and unstructured data types. To illustrate this it has been estimated [ASIGA] that everyday businesses and consumers together create 2.5 quintillion bytes of data. Each month 30 billion pieces of content are added to Facebook. Each day 2 billion videos are watched on YouTube. By 2015, 3 billion people will be online sharing 8 zettabytes (8 by 10^21) of data. There have been growing ethical concerns about Big Data. For example, Matzner [2014] argues that the vast array and variety of data coupled with new data mining and knowledge discovery techniques create new types of privacy invasion and indeed challenges the very notion of privacy. If this is so then the current and proposed approaches to personal data protection are likely to be inappropriate.

On 25 January 2012, the European Commission unveiled a draft *European General Data Protection Regulation* that will supersede the Data Protection Directive. Will this address the ethical issues surrounding Big Data – probably not. Even if it does, how long will it take for this to be implemented - probably many years based on the previous data protection legislation track record and by that time technology will have morphed yet again. Alexander Solzhenitsyn [1969] wrote, “As every [wo]man goes through life, [s]he fills in a number of forms for the record, each containing a number of questions. There are thus hundreds of little threads radiating from each [wo]man, millions of threads in all. If these threads were suddenly to become visible, people would lose all ability to move.” It would seem his words have come true with the advent of Big Data.

3. Toolset for practical IT ethics

IT is a practical endeavour which is supported by many design and development tools. If the ethical dimension is to be taken into account through every step of design and development, and ultimately in implementation and operation then this consideration must either be embedded in existing tools or new tools produced which are compatible with existing technologically-oriented tools. For nearly 20 years I have been involved in the development of a toolset for practitioners. In many instances this has been in collaboration with professional bodies such as BCS and IMIS in the UK, ACM and IEEE-CS in the US and ACS in Australia. A set of five tools are very briefly described here, of

which three are then discussed in the next section as part of the experiential learning approach put forward as a way to prepare future IT professionals.

Product-Process (see Rogerson, 2010) The decision-development-delivery cycle of IT is surrounded by complex interrelated ethical and social issues. These need to be addressed during the IT process and embedded within the IT product. Process concerns the activities of ICT professionals when undertaking research, development and service/product delivery. The aim is for professionals to be virtuous in Aristotelian terms. In other words a professional knows that an action is the right thing to do in the circumstances and does it for the right motive. Product concerns the outcome of professional ICT endeavour and the potential impact of these products on people, society and the environment. The ethics focus of the product perspective is technological integrity from, for example, a Kantian or utilitarian perspective. This can be addressed by embedding ethics within ICT products themselves. This tool provides a simple framework to consider issues from the two perspectives.

DIODE (see Harris et al, 2011) DIODE is a structured meta-methodology for the ethical assessment of new and emerging technologies. There are two different angles for the ethical assessment of new technologies: a strategic/abstract angle and a project/application specific angle. DIODE includes two channels to accommodate this distinction. DIODE comprises five components: Define questions; Issues analysis; Options evaluation; Decision determination; and Explanations dissemination. Without training and guidance, it is difficult for technologists to take ethical concerns into account during the development and deployment of new technologies. DIODE can provide that training and guidance through a practical meta-methodology which should help IT professionals, policy makers and academics.

SoDIS (see Gotterbarn and Rogerson, 2005) Limiting the focus of risk analysis to quantifiable factors and using a narrow understanding of the scope of a software project are major contributors to significant software failures. The Software Development Impact Statement (SoDIS) process extends the concept of software risk in three ways; it moves beyond the limited approach of schedule, budget, and function; it adds qualitative elements; and it recognizes project stakeholders beyond those considered in typical risk analysis. It is a proactive feed-forward approach which enables the identification of risks in the manner in which IT is developed (Process) and IT itself (Product).

Professional code of ethics (see http://www.acm.org/about/se-code) Every IT professional body has a code of conduct. The Software Engineering Code of Ethics and Professional Practice of ACM and IEEE-CS in partnership has international standing having been translated in many languages and adopted by many professional bodies worldwide. It provides a practical perspective within its preamble and principles. The preamble states, “These Principles should influence software engineers to consider broadly who is affected by their work; to examine if they and their colleagues are treating other human beings with due respect; to consider how the public, if reasonably well informed, would view their decisions; to analyse how the least empowered will be affected by their decisions; and to consider whether their acts would be judged worthy of the ideal professional working as a software engineer. In all these judgments

concern for the health, safety and welfare of the public is primary; that is, the 'Public Interest' is central to this Code."

Dependencies Mapping (see Rogerson, Wilford and Fairweather, 2013) This is a method comprising a lexicon, a diagramming tool, relationship tables and structured commentaries. A dependencies map provides a structured way for knowledge of ethical issues to be identified and organised. Dependencies maps go beyond stakeholder relationships by covering multiple types of entities (such as processes and artefacts), and multiple types of relationships. Dependencies mapping is undertaken without the constraints of a pre-defined lens such a stakeholder, data or operation. A dependencies mapping tool can be utilised to raise awareness about the many external influences and impacts resulting from the development and use of IT.

4. Experiential learning for Computer Science and Software Engineering undergraduates

There is an expectation by computer science and software engineering undergraduates that they will be instructed in the theories, methodologies and application of IT. They are usually unaware and therefore have no expectation that their university education must include the ethical and societal context within which IT exists. These technologically-oriented students have a resonance with experiential learning. Consequently, any attempt to expose them to ethical and societal perspectives of IT is more likely to succeed if a varied diet of experiential learning is provided (see, for example Essendal and Rogerson, 2011). As Benjamin Franklin once wrote, "Tell me and I forget, show me and I remember, involve me and I understand." Quite simply, academic philosophers delivering lectures about the nuances of ethical theory is inappropriate and indeed is likely to strengthen the barriers behind which purist technologists will defend their technological ideology. In this section a series of experiential learning examples is discussed. These have been used and subsequently honed over many years to provide appropriate instruction for IT professionals of the future. The opportunity to participate in an active rather than passive manner leads to an experiential journey of maturity from tutor-led activities to student-led activities. Through this process, the IT professionals of the future are more likely to gain the necessary skills and knowledge to act in a socially responsible manner not on the basis of instinct and anecdote but on rigour and justification.

Exercise using Product-Product

In the public domain there are many *Invitation to Tender* documents (ITT) relating to IT. This provides a rich resource of real world requirements for IT solutions. Using the Product-Process approach students, in small teams, are asked to analyse the specification of requirements included in a given ITT. The task is defined as:

- Read the specification in the ITTs
- In groups, discuss the potential ethical issues
- Split these issues into Process and Product

- Complete the Ethics Checklist form
- Present your findings to the cohort as an outline of the system followed by the identified Process and Product issues

This exercise gives students the opportunity to investigate current IT requirements which enables them to place their studies in the context of the real world. This consideration, through an ethical lens, encourages them to look beyond the technical. The requirement to present their small team's findings to the complete student cohort helps them to focus and firm up their thoughts on the identified ethical issues. This is a good way to experience for the first time an ethical analysis of an IT solution at its onset. The tutor can tease out general themes based on ethical theory out of the findings thereby providing the students with some insight of conceptual underpinnings.

SoDIS Project Auditor laboratory

SoDIS has been translated into a software decision support tool called SoDIS Project Auditor (SPA) (available at http://www.softimp.com.au/sodis/spa.html). Students use SPA in a computer laboratory over several weeks. For these laboratory sessions a fictitious company called CHEMCO has been created. Chemco produces polyester and alkyd resins, gelcoats and conventional and inverse water based polymers from four manufacturing sites. It has decided to build a new manufacturing plant in Midtown and this will be operated using a new production control system called PRO-CHEM. (see http://www.ccsr.cse.dmu.ac.uk/staff/Srog/teaching/info3402/Chemco2/index.htm)

SPA computer laboratories of up to 16 students split into teams of three or four are held to investigate PRO-CHEM.There are three phases to this extended activity as follows:

- Case Start-up Session where the objectives are: to review the CHEMCO company; to introduce the requirements of the new production control system; to identify the stakeholders of the system; and to initialise the SoDIS analysis.
- PRO-CHEM SoDIS Analysis Sessions where the objectives are: to undertake a SoDIS analysis for an allocated stakeholder subset of PRO-CHEM; and to produce a comprehensive data set in preparation for distillation.
- Case Outcome Preparation where the objectives are: to review the SoDIS analysis for an allocated stakeholder subset of PRO-CHEM; to identify the main concerns about PRO-CHEM; and to prepare a presentation of findings for the Board of Directors.

This extended activity gives students the opportunity to analyse thoroughly, from an ethics perspective, a system development project in its initial stage. Using a software tool in a computer laboratory to undertake this work places students in a familiar setting albeit the task itself is very different. SPA structures their discussions and they experience a dichotomy of opinions as to what is acceptable and unacceptable in terms of the proposed system. The final output is a board-level report through which they experience the challenge of distilling a large amount of detailed analysis which combines ethics and technology into

a succinct report that is accessible to a board of directors many of whom are likely to have little technical knowledge and experience.

Exercise using the Software Engineering Code of Ethics and Professional Practice

This exercise is undertaken in a large group setting on an individual basis. Students are given a case study of a system which has been developed and implemented. The case focusses on the ongoing operation of the system and provides details of the experience of users and the manner in which IT personnel respond to users, maintaining and modifying the system as a result. The case study has some obvious and some obscure issues within it. The student task is structured as follows:

- Use the Software Engineering Code of Ethics and Professional Practice to consider the case study.
- Did anyone violate any of the ethical principles in the code? If so, was the violation justified? Why do you say so?
- What "policy vacuum" does the case reveal that could be filled by adding a new principle to the code?
- How could that new principle be stated and justified?

The exercise concludes with a large group discussion of the students' findings. This is an opportunity for students to experience the value of a code of ethics if used proactively. The tutor summarises the session through offering a simple checklist in the form of five ethics-grounded questions (shown in parentheses) as follows:

- Who is affected by your work? (Utilitarian)
- Are others being treated with respect? (Kantian)
- How would the public view your decisions? (Publicity test)
- How will the least empowered be affected? (Rawlsian)
- Are your acts worthy of the model computing professional? (Virtue ethics)

Finally the tutor points out that a code of ethics provides a practical justification for action and offers a framework within which to structure professional work.

Student-led activities

Conventionally, student-led activities take place in small group sessions such as tutorials. The SPA computer laboratories and ethics analysis of case studies (see, for example, Bynum and Rogerson, 2004, Chapter 3) are indicative of this. Large group student-led activities offer a different experience. A variety of approaches can be adopted such as break-out activities, periods of reflection, topic presentations and formal debates (Essendal and Rogerson, 2011), two of which are outlined here.

- Topic presentations: The culmination of a module on IT Ethics is a student-led seminar for which students organise, chair and present papers. A typical range of presentation topics taken from previous seminars is: How to prevent children from accessing unsuitable content; Engaging older, handicapped and other excluded people in ICT; Examples of real situations of professional responsibility; Software with Adware is ethical or unethical?; and New media – forms and reliability of information.
- Formal debates: This provides students with the opportunity to develop their critical thinking, to increase their ability to defend ideas, to improve their communication skills and to be tolerant of the arguments of others. Typical motions used in previous student-led debates are: "This house believes it is acceptable to force on-line services on those who prefer off-line interaction with government or who are technophobes" (Utilitarian focussed debate); "This house supports the development of assistive technologies that exceed human abilities" (Aristotelian focussed debate); and "This house believes it is unnecessary to consider cultural diversity in generalised ICT products and services in order to promote ICT acceptance and effectiveness" (Kantian focussed debate)

5. Conclusion

Based on my experience of the many students I have had the privilege to teach, I believe IT professionals of the future do care about the impact they will have on society. I have had former students contact me about whistleblowing on unethical practice and about how the ethics element of their degree education has helped them to shape their professional lives.

However there are problems that need to be addressed and resolved. Too many IT professionals hide in technological clouds seemingly indifferent to the ethically charged nature of IT. It is unclear whether this is through lack of awareness or a belief such issues are outside their scope of responsibility. Today we have the wherewithal to build fit-for-purpose ethically sound systems by design but I worry that it still happens more by accident.

In the past from the 1980s onwards, progress was made in ensuring the ethical dimension of IT was considered in education, research, government and industry. Sadly today there is a sense of going backwards. It is important to find out why this is so. Perhaps it is because there are not so many headline grabbing IT failures in the media these days. Perhaps it is because the excitement of IT ethics as a frontier has gone as ethics has moved more into the mainstream. Perhaps it is because of the sophistication of new technologies which increases transparency and makes it even harder to comprehend the potential issues. Perhaps it is because ethics has been politicised through target setting and the demand for tick-box compliance. Perhaps it is because public bodies, professional bodies and universities seem to place less emphasis on

ethical issues. Perhaps it is because there is a growing silo-mentality in the delivery of ethics education at the expense of a transdisciplinary approach.

It is for these reasons that we need to educate our future generations of IT professionals in a way that gives them practical skills to address the complex ethical and societal issues which surround evolving and emerging IT. I firmly believe such education should be based on a varied diet of participative experiential learning delivered by those who have a practical understanding of the design, development and delivery of IT. It is for all in the IT profession to rise to this challenge and safeguard not only the IT profession but also society at large.

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Biography

Simon Rogerson is Professor Emeritus in Computer Ethics and former Director of the Centre for Computing and Social Responsibility at De Montfort University, UK. Following a successful industrial career where he held managerial posts in the computer field, he now combines research, lecturing and consultancy in the management, organisational and ethical aspects of ICT. He gave up his fulltime post in September 2010 and now works part time. He has published over 300 academic papers and written 6 books. He conceived and co-directed the ETHICOMP conference series from 1995 to 2013. He received the 2000 IFIP Namur Award for outstanding contribution to the creation of awareness of the social implications of ICT. In 2005 he became the first non-American to be given the prestigious SIGCAS Making a Difference Award by the ACM. He is a Vice President and former Chairman of the Institute for the Management of Information Systems. He is editor of the Journal of Information, Communication & Ethics in Society. He is a Fellow of BCS, The Chartered Institute of IT; a Fellow of Institute for the Management of Information Systems; and a Fellow of Royal Society for the encouragement of Arts, Manufactures and Commerce.

Shaping Citizens and Subverting Virtues:
The Hidden Politics of Internet Technologies

V. Nash

Abstract. *This short paper considers the ways in which Internet technologies, apps and platforms might be shaping the development and expression of citizens' political character. We begin by examining contemporary liberal political theory to see how it deals with the connection between individuals and the societal institutions, relationships or practices that shape them, then move on to develop an account of the liberal citizen's moral character. In so doing, we identify certain key characteristics which liberal citizens must be presumed to manifest before proceeding to give examples of the ways in which Internet technologies and platforms might play a role in these processes of socialization.*

Keywords: Liberalism, Ethics, Internet, Politics

As a body of political thought, liberalism is often caricatured as being all too agnostic between different conceptions of the good life. What is deemed to matter most is not the value or importance of the values chosen, but the fact that they were indeed freely chosen by individuals rather than imposed by the state. Such a caricature is not fully accurate, however. Liberal political theory expects its citizens to manifest certain crucial moral characteristics in order that they can be the sorts of people who embody and enact liberal political principles of justice. In order to ensure that citizens come to develop these characteristics, liberals need to take account of the various social and political factors that shape their development. Clearly this is particularly important if liberals hope to have any chance of guaranteeing the survival of these characteristics amongst citizens in the 'real' world. Although some of the most famous liberal political theorists have been accused of ignoring these factors, of being too methodologically individualist in their approach to theorizing the liberal state, there is a rich body of work which accepts empirical holism as a necessary foundation of any sensible normative theory of the state. Such a holistic account

accepts that social institutions, relationships and traditions influence the development of individuals qua citizens, and in turn, that this realization should inform our political theory by clarifying what sorts of policies and principles support or undermine the inculcation of liberal citizens. The following paper asks precisely this question, considering it from the perspective of Internet technologies, and the coders, engineers, and designers whose work shapes the evolution of these networks. We begin by examining contemporary liberal political theory to see how it deals with the relationship between individuals and the societal institutions, relationships or practices that shape them, then move on to develop an account of the liberal citizen's moral character. In so doing, we identify certain key characteristics which liberal citizens must be presumed to have before proceeding to give examples of the ways in which Internet technologies and platforms might play a role in such processes of socialization.

Liberal Holism

Liberal political theory can be traced back to the radical thought of political giants such as John Locke, Thomas Hobbes and John Stuart Mill. Taking as their starting point a fundamental belief in the moral equality of all men (sic), their political writings tore apart the preceding acceptance of hierarchical political order grounded in such principles as the divine right of monarchs to rule. The individualism of these early theories is as necessary as it is complex: if there is no God-given right to power, then the existence of the state and its inevitable restricting of individual liberty can only be justified if each and every citizen would voluntarily accept such a restriction. The concept of a Social Contract, setting out the limits of state powers in the face of benefits to the each citizen is radically individualist, and contemporary proponents such as John Rawls seemed to be writing within this tradition.

Following a backlash in the 1980s, where Rawls, in particular, was heavily criticized for not paying enough attention to the multiple ways in which individuals seem to be embedded in particular social contexts, liberal political theory has become much more accepting of the principle that there is no such thing as the 'asocial' individual. We may choose to value individual rights and freedoms above group rights or values, but this is compatible with accepting that human beings can only develop their full potential through interactions with others, or that language and culture are irreducible to individual behaviours. The philosopher Charles Taylor helped to advance this debate by emphasising a distinction between atomism and holism. The former approach holds that:

> "...in (a), the order of explanation, you can and ought to account for social actions, structures and conditions, in terms of properties of the constituent individuals; and in (b), the order of deliberation, you can and ought to account for social goods in terms of concatenations of individual goods." (Taylor 1989: 159)

In practice, Taylor goes on to note, we too often conflate 'ontological' claims of holism (the way we think things are), with 'advocacy' claims of holism (the way we think things should be). Just because individual actions, positions or beliefs can sometimes only be explained with recourse to social actions and structures

doesn't mean that we need to place value on those social actions or structures or seek to preserve or promote them. Gender inequality may be better explained by looking at a history and culture of patriarchy rather than the actions of individual men and women, for example, but that doesn't mean that we should seek to preserve such a culture. However, this doesn't mean that ontological claims are irrelevant to how we think the political world should be ordered, as although we can reflect on our culture, our upbringing, social context etc, it's hard to escape them completely. As Taylor puts it,

> "...one's ontology structures the debate between alternatives, and forces you to face certain questions." (Taylor 1989 p. 181)

Whilst it's beyond the scope of this paper to present a fully-fledged defence of holism, the key point to note is that even modern liberal politics, with its emphasis on individual rights and the value of personal autonomy, can accept the role of social structures, practices and institutions in shaping the moral development of its citizens, and potentially limiting the array of normative principles and policies that might be adopted. To this extent, it's a relevant and important question to ask how these processes of political socialization work, and what responsibilities we bear in shaping these processes through the design and production of technology.

Liberal Character

As a branch of philosophy, modern liberal political theory takes as its starting point a conception of the person that is explicitly normative rather than descriptive. In order to arrive at a theory of the ideal liberal state, it begins with a view of individuals that highlights certain traits which real, embodied individuals may possess to a greater or lesser extent. One way of thinking about this is a view of personhood as expressing our fundamental values about what it means to be human in a modern liberal state. Different theorists disagree as to what count as the crucial personal qualities, but there is a broad consensus around a large subset of these, and of these, it is easy to understand how Internet technologies and platforms might play a role in helping or hindering their development.

A good starting place is Rawls' account of liberal citizenship. He explicitly defends that conception of the person as normative rather than simply descriptive, and as specifically political rather than scientific or empirical (Rawls 1993). There are two vital elements of moral personality, namely the capacity for a sense of justice and the capacity to frame, revise and pursue a conception of the good. Indeed, it's in virtue of possessing these two characteristics that liberal citizens are declared to be free and equal, and thus deserving of treatment according to liberal principles.

> "Since we start within the tradition of democratic thought, we also think of citizens as free and equal persons. The basic idea is that in virtue of their two moral powers (a capacity for a sense of justice and for a conception of the good) and the powers of reason (of judgment, thought, and inference connected with these powers), persons are free.

> Their having these powers to the requisite minimum degree to be fully cooperating members of society makes persons equal." (Rawls 1993: 18-19)."

Rawls goes on to explain exactly what he means by these powers, and it becomes rather clearer how social institutions, habits of interaction or forms of relating to others might influence the development of such powers:

> "A sense of justice is the capacity to understand, to apply, and to act from the public conception of justice which characterizes the fair terms of co-operation. Given the nature of the political conception as specifying a public basis of justification, a sense of justice also expresses a willingness, if not the desire to act in relation to others on terms that they can publicly endorse." (ibid. p. 19)

This depiction of 'reasonableness' in our political interactions is a core feature of many liberal political theories (see e.g. Scanlon 1982 or Barry 1995) but it is actually very demanding, implying a fundamental desire to cooperate. Specifically, we should be willing to suggest *fair terms* of co-operation, *endorsable* by others, and to actually *abide by these* if others do so as well, plus have a desire to be, and to *be seen as a fully co-operating member of society*. In practice, it's likely that many of us would fail to meet such stiff criteria, but as a goal to aim for, this is an inspiring account, and we might indeed hope that our political and social institutions support such high standards rather than undermine them.

Similarly, we might unpack Rawls' second moral power, defined as "...the capacity to form, to revise and rationally to pursue a conception of one's rational advantage or good." (ibid. p.19). It's in virtue of the fact that people are autonomous, or self-determining, that liberal principles of fair co-operation are deemed desirable. To put it another way, it's only because liberal political theory views individuals as equally capable of such autonomous self-direction that social justice is needed. Quite simply, this grounds the fundamental normative belief in the moral equality of all. Notably, this power doesn't assume any particular 'conception of the good' or set of personal values, but rather looks at the capacity to hold such a conception. To that extent, the expectation is that individuals develop faculties of self-awareness, critical reflection, and a willingness to independently pursue particular values that matter 'to you' whether or not they coincide with those of other close familial or social ties. More will be said later of the social conditions necessary for the development of such faculties.

Rawls' moral powers may be fundamental to the sophisticated liberal account, but they can seem incredibly abstract. Before proceeding to show how information technologies may affect the development of liberal moral characteristics, it's probably helpful to contrast this very analytical account with rather more concrete examples. Several liberal theorists have provided more detailed accounts of the liberal 'virtues' needed to preserve and promote the liberal state. William Galston (1991) provides a very clear account. He argues that liberalism must presuppose certain purposes or goals. Some are probably

necessary in any type of state (loyalty, law-abidingness, moral courage), whilst others are specific to the liberal society, economy or polity. Thus, for example, our modern liberal societies are marked by features of diversity and individualism. These two features can only be maintained if individuals manifest sufficient degrees of independence and tolerance. The liberal citizen should be capable of respecting others and moderating her behaviour accordingly. She also has to be discerning enough to elect credible representatives and evaluate their performance, must be sensitive to the multiple demands placed on government and be prepared to moderate her own demands accordingly. Galston thus sets out the personal characteristics that individuals must possess in order to function as liberal citizens within a liberal state.

Stephen Macedo's defence of liberal virtues goes one step further, presenting liberalism as inherently non-neutral, favouring a particular set of perfectionist values. He articulates a vision of citizenship, flourishing and character that he believes exists at the heart of this ideology.

> "We can oppose government intrusiveness and paternalism while allowing that there are attitudes and capacities that liberals ought to have and develop, and that when people do have and develop them a liberal regime will flourish. Liberal politics depends on a certain level and quality of citizen virtue, which is in many ways promoted by life in a reasonable just and tolerant, open liberal regime." (Macedo 1990:3)

On this view, we might differentiate between the characteristics which permit minimal acceptance of liberal justice (Galston), and the virtues which exemplify a flourishing of liberal character. In this light, Macedo presents mere tolerance as less desirable than common appreciation and enjoyment of diversity, and grudging acceptance of others' rights as a poor alternative to genuine respect.

It's beyond the scope of this paper to convince readers that such characteristics are essential to the persistence of liberal politics. The most fundamental (the two powers as outlined by Rawls) do seem least controversial; Galston's practical approach is probably necessary to the extent that at least a majority of citizens must display such traits, while the richer, more ambitious account from Stephen Macedo is harder to argue for. But it should at least seem clear that there are certain personal moral characteristics which are valued in liberal societies, either because they support the general application of liberal principles by citizens, or because they express aspirations of character to be aimed for, albeit not always attained. And whilst none of these theorists argue that all citizens must manifest such virtues, the suggestion is that at least some of them must:

> "The broad hypothesis is that as the proportion of nonvirtuous citizens increases significantly, the ability of liberal societies to function successfully progressively diminishes." (Galston 1991: 216).

There would thus seem to be good reason for liberals to concern themselves with processes of socialization, and the role that social and political institutions and practices play in inculcating or undermining the development of such characteristics.

Nurturing the liberal virtues

Much of modern mainstream political theory is more concerned with the distribution of political goods and burdens or the mode of legitimate decision-making than the moulding of the citizen body. It wasn't always so. Famous political treatises ranging from Plato's Republic to Jean-Jacques Rousseau's Discourse on the Origin of Inequality or Alexis De Tocqueville's Democracy in America devote many pages to the relationship between social/political institutions and the cultivation of political characteristics. Whilst we're now wary of Plato's suggestion that poetry, music or drama should be censored in order to limit its corrupting influence, Rousseau's depiction of 'civic religion' has some potential overlap with contemporary debates about cohesion in the face of diversity, whilst de Tocqueville's view that participation in civil society builds participatory habits also still has resonance. Modern liberal political theory has been slow to respond. There is a body of literature that considers processes of socialization, and in particular the role of education in shaping future liberal citizens (e.g. Callan 1997, Macedo 1996), but much of the best scholarship falls outside these politics' disciplinary boundaries and is found within sociology, education and psychology. Of more relevance for this current topic, in recent years we've also seen the development of a rich seam of literature within the philosophy of information or computing, and information and library studies specifically addressing the interplay between technology, values and design, albeit with less emphasis on the implications of this for politics.

Yet there is great merit in considering these questions from an explicitly political angle. First of all, states themselves exert a direct influence on some of the most important socializing institutions such as schools and education systems, publicly funded arts or public broadcasting. They are responsible for the symbolic expression of social norms in systems such as taxation and welfare, adoption and social care and the design of public infrastructures including public information systems and databases. Further, states directly limit the actions of citizens and companies through laws and regulations, limiting the extent of free speech or access to information, acting to prevent hate speech or defining the limits on data retention, sharing and use. Last, but not at all least, politics is concerned not just with the actions of states, but also citizens, so it is fair to ask what moral or political responsibilities any of us have when our involvement in the design of new technologies will in turn shape the moral and political interactions of others. To this extent, liberal political theory should devote far more consideration to questions of socialization, and specifically, to the role that information technologies are playing in moulding citizens and structuring states. Below, I give two examples of liberal characteristics or virtues which are affected by the design and operation of information technologies, focusing on the role of Internet filtering and moderation in the development of moral autonomy in teens and young adults and the effect of personalization and uncivil or hate speech on liberal tolerance.

Moral autonomy

Many aspects of children's lives are now mediated by the Internet. It's become a place where kids spend large amounts of time creating and exploring their online identities, engaging with friends, gaming, learning and consuming goods and services. All these activities may be a normal part of children's lives, but many are subtly re-shaped or reconfigured online, with the development of new norms (e.g. changing attitudes to copyright or privacy) or practices (e.g. the rise of the selfie). As these altered practices and norms play out, the range of risks and opportunities facing children is also transformed. Against a backdrop of media scare stories about the dangers of online predators and the ubiquity of pornography, the greatest source of anxiety for many parents and policy-makers is perhaps is the extent to which children and teenagers can now conduct much of their personal life online, in an environment which is perversely private in the sense that a responsible adult can easily be excluded, but public in so far as the content is so easily made visible to unknown others.

A common policy response to many of these risks is that content deemed potentially harmful to children should be filtered, a child-protection solution with a long history in other media such as television (Heins 2001). Filtering methods can be applied at different 'choke points' across the Internet ranging from government-directed schemes where blocking is carried out at backbone level, to filtering by search Internet Service Providers (ISPs) or search engines, all the way down to filtering at the level of the institution or household. Filtering policies are unavoidably controversial insofar as they effectively censor speech and expression. In order to minimize such restriction, advocates of free speech argue that if filtering must be used, then filtering decisions should be made as close as possible to the individual user, ideally allowing each individual to determine which content they do or do not wish to view, or for children to discuss their needs alongside their parents as filters are set up. Despite this, several countries, including Denmark, South Korea and the United States have introduced legislation requiring publicly funded schools and libraries to install filtering software to protect children using their facilities. Other countries, such as Australia, Germany and the UK have held lengthy public debates concerning whether ISPs should be mandated to block adult content such as pornography by default, with access only allowed upon proof of age. A more moderate approach is the introduction of so-called 'active choice' policies, whereby households signing up to new broadband contracts are asked whether they wish to apply filters installed at the household rather than the device level. In theory this makes filtering more accessible to families who would not have know how to purchase or install it, but it remains a rather blunt tool with no options for personalized access controls, meaning that adults and children alike, or a five year old and a fifteen year old will face the same walled garden. Inevitably, as with state-imposed filtering, it also still results in a more limited information environment with often inaccurate filtering outcomes.

Filters are undoubtedly an important tool that can help parents enact choices over what their children access. But any state-mandated filtering is inherently controversial, both because it restricts access to otherwise legal content, often

for adults as well as children, and also because no filter is ever 100% effective, either over-blocking legitimate content or under-blocking undesirable content. Over-blocking is particularly problematic if the material has educational or informational value, such as that pertaining to relationships, sexual health or even art. There is also a danger that when filtering mechanisms are in place, parents or educators may be lulled into a false sense of security, believing that no further risks exist. But in addition to these rather consequentialist objections to filtering, there are also more fundamental deontological objections. As outlined above, personal autonomy is a valued as one of two essential moral characteristics for citizens living in liberal states. From this perspective, mandatory filtering policies can be seen as inherently problematic insofar as they limit the individual's capacity to direct their own moral life by accessing certain online materials or engaging in restricted forms of speech or expression. Specifically, filtering technologies (like digital rights management systems) reduce the scope of individual choice even for adults, by rendering certain actions or selections impossible within that technical framework.

It could also be argued that these filters have an even greater political impact on young people and children by reducing their capacity to develop moral autonomy in the first place. Against the concerns for autonomy or rights to information and expression set out above, it could simply be argued that children are not and should not be seen as autonomous, and that as such they cannot have First Amendment-type rights (Etzioni 2004). Instead they precisely need the guidance of parents, educators or state censors to protect them from the worst excesses of Internet content. Whilst it's beyond the scope of this paper to give a fair account of the complex and inherently normative debate between these two positions, we can note here that recent liberal thinking on the issue adopts a 'middle position'. Children can be seen as having 'evolving interests' in freedom of expression and information as they mature, but all require some level of access to information and expression online in order to fully develop Rawls' 'moral powers' that are such a fundamental part of what it is to be a morally autonomous adult in a liberal society (Macleod 2004). Adopting such a perspective implies that whilst some level of filtering may be appropriate for children of different ages and levels of maturity, blanket policies that restrict access to large categories of material for children whether they be 5 or 15 are likely to infringe minors' capacity to develop autonomously, particularly in a context where more and more information is accessed online. This may be particularly damaging for minors who are exploring aspects of personal or sexual identity neglected by mainstream education or culture, who may seek access to precisely the sorts of materials likely to be filtered, either deliberately or as a result of over-blocking (Hull 2009). To this extent, the design and implementation of filtering tools or algorithms involves not just ethical decisions about what should or should not be filtered, but also political ones, concerning possible effects on the moral development of children and the autonomy of all.

Liberal Toleration

Just as filtering technologies may impact on our capacity to frame the conceptions of the good life that mark us out as liberal individuals, so other

Internet platforms or technologies may shape our capacity for toleration, specifically through narrowing our range of positive experiences of different opinions or others.

Susan Mendus identifies two features common to most accounts of toleration: it arises under conditions of diversity, and further this diversity gives rise to disapproval, dislike or disgust (Mendus 1989). Toleration is thus the act of refraining from interference or criticism despite such objections. However, the issue becomes more complex when we consider the appropriate grounds for tolerant behaviour. The idea that unchosen, largely unchangeable differences in others such as skin colour, gender or sexuality should be grounds for toleration seems far less reasonable than the view that we should tolerate others with different religious or political views. We are supposed to respect persons as equally possessing moral dignity, and should judge them only on the features of their lives for which they can be held morally responsible. Yet in practice, some of the greatest sources of intolerance arise in relation to cleavages such as social class, ethnicity, gender or sexuality. In each of these cases there are concerns that the Internet may be exacerbating rather than improving matters.

Rawls himself provides an account of moral development that emphasizes the importance of a child's interaction with non-family members in learning that different relationships provide opportunities to play out different roles. Learning to play different roles involves learning the basic rules of co-operation, and having to appreciate the roles and viewpoints of others.

> "First of all, we must recognize that these different points of view exist, that the perspectives of others are not the same as ours. But we must not only learn that things look different to them, but that they have different wants and ends, and different plans and motives; and we must learn how to gather these facts from their speech, conduct and countenance. Next we identify the definitive features of these perspectives, what it is that others largely want and desire, what are their controlling beliefs and opinions. Only this way can we understand and assess their actions, intentions and motives." (Rawls 1971: 468-9)

These first steps towards acknowledging and understanding social and political difference are the foundation of a tolerant attitude. Macedo develops the argument still further, suggesting that a crucial aspect of citizenship education rakes place outside the classroom (Macedo 1996). He argues that pluralism and membership of crosscutting groups is one of the best ways to acquire 'co-operative virtues'. Interaction across time breeds trust and empathy, whilst belonging to more than one social grouping ensures that individuals never identify themselves with just one single interest, and learn to see others also as complex, multi-faceted moral beings.

In this context, it is perhaps useful to recall a current live debate about the extent to which online interactions facilitate or undermine citizens' exposure to different views or ways of life. Concerns have been raised about the effects of increasing 'personalisation' in online media and platforms, where opaque algorithms alter search results, highlight content or identify potential 'friends' on the basis of a

person's existing online history (Sunstein 2007; Pariser 2011). Specifically, the concern is that the reasonable commercial desire to retain customers will result in individuals being served up more of what we want/agree with/are familiar with, and less that challenges or upsets our views. What Sunstein terms the 'daily me' risks reinforcing our preconceived assumptions, and he suggests, may even lead to greater polarization of views: '…there are serious dangers in a system in which individuals bypass general-interest intermediaries and restrict themselves to opinions and topics of their own choosing.' It's not clear what the implications of such trends will be for liberal virtues such as tolerance, but if it is the case that exposure to different others is a key foundation of tolerant behaviour, then we must hope such predictions of personal 'balkanisation' are exaggerated.

The preceding discussion assumes that informal education and social interactions are key in political socialization. Clearly, political institutions also have an important role to play. The allocation of liberal civil, political and social rights makes clear to all that each and every right-holder is to be treated as an equal, regardless of differences of culture, ethnicity, class or religion. At base, the minimum level of toleration that a liberal society can demand from its citizens is that they recognize and respect these rights in every relevant situation. Likewise, the democratic process is in part justified by its potential to incorporate many different voices and values in a public decision-making process, whilst redistribution expresses a commitment to all members of society that each counts equally from a moral point of view. Each of these political institutions contributes towards education for toleration by stressing the meaning of common citizenship as an identity that is blind to individual differences.

To the extent that democratic political institutions are thus both symbolic of, and also enacting equal political rights, political theory has long recognized the importance of ensuring that these institutions are not themselves riven by inequality. Debates about the representation of dominant versus minority voices have helped us to understand how formal political rights do not automatically translate into substantive political equality. Relevant inequalities persist in the possession of political resources whether these relate to money, education, voice, authority or experience (Young 1990). Against this backdrop, the Internet is often presented as a means by which minority voices can find expression, where education, money or privilege have less effect (Benkler 2006; Shirky 2008). Unfortunately, empirical studies have shown that such optimism is unfounded, with existing social and political inequalities often reproduced in online forms of participation (e.g. Hindman 2009).

A source of even greater concern, however, is the possibility that online political participation risks worsening political inequality and increasing intolerance. Recent coverage of online trolling, flaming and harassment, for example, has suggested that deliberate efforts to silence the voices of women or members of other minority groups may serve to undermine social and self-respect for these groups. High-profile campaigns of hate-speech, conducted initially by just one or two individuals have demonstrated the capacity to expand rapidly, drawing in a much wider group of haters (Citron 2010). Such campaigns serve to threaten and humiliate their targets, who have often done little more to draw such scorn

other than speak out on a public matter. Women are particularly vilified, receiving insults that refer to their sexual predilections, habits or appearance, ignoring their status as equal citizens and presenting them as no more than the sum of their physical parts. As Martha Nussbaum (2010) notes,

> "To objectify a person is to treat her as thing, an object, although, being a person, she is not really a (mere) thing...So often, high-achieving women are treated, on Internet gossip sites, as if they are no more than a photo, or a set of body parts." (Nussbaum (2010): 69 & 71)

It's difficult to see how a tolerant and egalitarian public culture is strengthened by the persistent interruption of such uncivil, hate-laden voices. But in this latter case, it's harder to see how the role of coder or designer has a substantial ethical component. Certainly we can point to features of online fora that seem to result in more civil speech, but it would seem simplistic to suggest that every online space should be moderated or every debater identified with a real name. What this example should remind us of is the importance of community standards, terms of use and platform policies. Just as Twitter decided to tighten its policy on abusive speech, so every popular service will have to decide what (if any) limits to set on the behaviour of users, and how to go about policing this. As with the discussions of autonomy above, the point is that all such decisions have potential political and ethical import.

Conclusion: Ethics, political virtues and institutional design

In the cases set out above, there's no definitive empirical proof that the development of valued liberal moral characteristics is being undermined by the expansion of life online. There are a wealth of relevant studies which, for example, help to illuminate who experiences and who perpetrates online harassment (Citron 2010) or the extent to which filtering policies mistakenly block sensitive educational material (Deibert & Palfrey 2008), but it would nigh on impossible to identify macro-level effects on the political character of a nation. But to ask for such proof would miss the most fundamental point. Yes, in an ideal political world, such as the utopian society set out by John Rawls, we would want to ensure that our social and political institutions, relationships and practices support rather than subvert the development of liberal character. We would probably expect fundamental liberal principles to take a primary position in the design or regulation of these. But in a less than ideal political world there are necessarily multiple overlapping or competing factors that inform and affect the design and regulation of institutions, relationships and practices. Insofar as the Internet increasingly mediates so many aspects of our lives, coders, designers and engineers will necessarily play a role in the development and evolution of these. To that end, we should all be cognizant of the ethical and political implications of our work. The design of a filtering algorithm may have a significant impact on an angst-ridden teen trying to access much-needed information about contraception or sexual identity; the battle for audience share through the design of social network feeds may unwittingly help to reinforce our unconscious social or political biases, whilst policy decisions over terms of use for micro-blogs or comments sections on news sites may have a substantial

effect on the quality of speech. In each case, it is vital that as citizens, as makers or coders, we ourselves take a holistic view of our role in shaping the norms and practices of information societies. More than ever, it is vital to remember that ethical principles are not just for lawyers or philosophers, and that technologies are not value-free. Insofar as our Internet use supports or subverts the development of liberal virtues, it would seem that we all have a hand in shaping 'the good life'.

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Biography

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The Engagement of AICA for Computer Ethics

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AICA

Since many years AICA, the Italian Computer Society, created a special Committee on Computer ethics through the engagement of Ivo De Lotto, of Franco Filippazzi and of Norberto Patrignani.

The activity of the Committee has been developed through many theme workshops, during the AICA Annual Congresses or in other occasions, and with the assignement of special prizes for degree thesis on arguments related to Computer Ethics. From 2010 to 2013, 13 prizes have been given to students or research doctorates with the financial support of some International Rotary Districts. In 2014 10 prizes of around 3.000 Euro each will be funded by some Italian Rotary Districts under the name of ETIC 2014.

The objective is to promote during University Courses real focusing on the increasing relevance and direct impact of digital applications on ethical consequences both for business and consumer utilisation.

There is an increasing interest to prepare new ICT professionals having clear understanding of social consequences of risks due to unethical development and misuse of digital services.

This kind of social risks is a matter of special concern with regard to the widening use of videogames, of social networks by young people, even by very young children and with the proliferation on line of porno-pedophily messages focused on children.

On this subject AICA is working together with some associations such as Telefono Azzurro in order to fight such bad use of Internet and also with school authorities and teachers in order to prepare school and families to take actions for fighting such a misuse of the Net and avoid bad impact on children.

But certainly, the need of a wide understanding and real diffusion of Computer Ethics issues in all areas is requested by all Net applications and services.

Take the explosive diffusion of mobile apps which can imply heavy consequences, if badly focused, on all business and social activities limiting security issues or privacy issues and profiting of personal identity stealing or unethical hackering.

The evolution toward Cloud computing and Big Data, if out of control both from the point of security and unethical misuse of data, can dramatically put out of control the results for business and people.

We need to prepare ICT people, both developers and users, to understand and apply the value of Computer Ethics in their activity.

What happened (and unfortunately it is continuing to happen) in the financial sector through the misuse by some people of badly focused mathematical algorythms has contributed to create uncontrolled financial crisis at world level.

AICA is strongly focusing its activity on this issue, having in mind the increasing relevance of Computer Ethics in the training and certification of ICT professionals, in the preparation of so called e-leaders, of all managerial people using increasing on line applications in there day by day activity, in the preparation and support of teachers in all training areas, from all levels of schools to universities and business training centres.

The new ECDL version launched at the end of 2013 is focusing on areas such the on line collaboration, the security and lifelong learning, implying everywhere growing relevance of Computer Ethics issues.

Digital Revolution and Ethics: A Call for Action

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In most Italian technical graduate schools and technical universities the link between technology and ethics is, by and large, not adequately explored. The focus is on teaching and research of technology and science in a strictly disciplinarian manner, with only sporadic opportunities to discuss the ethical implications of both. This perhaps explains why in Italy it is common to hear otherwise very accomplished professors and scholars boldly and conclusively state that "technology is neutral." The little space devoted to the teaching of the ethics of technology and science in Italian academic curricula is, in turn, one of the main reasons for the low level of ethical awareness of many Italian technical professionals—computer engineers and computer scientists included.

The consequences of such ethical divide with respect to the situation in more advanced countries are serious. In a country, in fact, characterized by a generally low appreciation of the complexities of many ethical issues, the lack of ethical leadership by Italian academics and professionals deprives the country of much needed support and guidance in handling the increasingly complex ethical problems posed by technology in a broad range of fields, from medicine to energy, from the environment to the online world.

The Italian computer science and computer engineering communities have a particularly strong obligation to act. The digital revolution, in fact, is now touching not only vast parts of the economy, but also the domain of politics and media, as well as the personal lives of the majority of Italians. Although Italy is lagging behind in the adoption of digital technologies, soon we will be able to say that all Italians are, in one way or another, affected by the digital revolution. Who is going to guide them in addressing the many moral quandaries – small and large – posed almost daily by digital technologies? Who is going to advice the policy makers, who are facing more and more digital-related issues, ranging from surveillance to hate speech, from cyberwar to open government? Who is going to design software and digital infrastructures not only with the required technical skills, but also with an appreciation of the potential adverse social consequences of apparently innocuous technical decisions? Presently, there is no structured answer to these questions, and that is precisely the problem.

A problem that – it ought to be said – goes back in time. Italian universities, in fact, largely missed the Science, Technology and Society (STS) movement that started in the USA in the 1960's, leading to the establishment—in technical

universities such as MIT, but also in many other higher education institutions—of STS graduate schools and STS teaching programs. As we move deeper into the 21st century, a century that will be arguably even more affected by technology than the previous one, Italian universities needs to catch up with the more advanced countries and, in coordination with professional orders and organizations, devote much more attention to the complex interplay between technology and society.

In this regard, the computer engineering/science community may build on several important experiences in which ethical considerations have played an important role. I will mention just a few. The free software movement arguably ought to be first; Richard Stallman (MIT), in fact, launched it in 1984 starting from an analysis of ethical questions regarding software and then extending it to a broad range of digital issues, from ebooks to formats. Over the years Eben Moglen (Columbia University) has often studied the relationship between digital technologies and ethical issues, ranging from surveillance to social networks, from democracy to fundamental rights. In parallel, Yochai Benkler (Harvard University) has been exploring the world of sharing and cooperation made possible by digital technology and, more specifically, by the networked personal computer.

More recently, in response to the revelation of Edward Snowden, several prominent computer scientists – prompted by ethical considerations – have made technical analyses and proposals. See, for instance, Lazlo Barabasi and his manifesto addressed to fellow big data scientists. Or the security expert Bruce Schneier, who has invited his colleagues to re-think the Internet in order to ensure user privacy by default. Even Sir Tim Berners-Lee, who in the past had also advocated for Internet access as a fundamental human right, has recently called for the decentralization of the Net.

Digital technologies, just like any other technology, produce consequences. Sometimes the consequences are caused by design choices. Other times, by choices made by the owner/manager of the technology. In other cases still, the consequences are produced by users. In all cases, it should be clear that consequences mean responsibility. Future computer engineers and computer scientists deserve to be made aware of their ethical responsibilities. Society as a whole deserves to be assisted by our expert community to find its way through the digital revolution.

Opportunities and Limits of Codes of Ethics or Conduct in the Experience of Computer Ethics

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It is important today, as never before, to continue to meditate on the themes of Computer Ethics that began many decades ago (Moor, 1985). Our society is largely dependent on the operations of the computers (and, more generally, on the technologies of information and communication [ICTs]) to perform its most essential tasks. The map of our dependencies draws, at the same time, the map of our own fragilities, and thus it requires us to be concerned with a moral meditation that involves, as well, the meaning of such fragility. In the field of Computer Ethics, this has demanded the adoption of several codes of ethics or conduct.

This was a positive achievement, because it made manifest a growing sensitivity to the ethical and social implications of technological development, which runs through the whole society and involves those who are called to reflect on these issues and especially those which are called upon to give them a concrete implementation. The creation of codes of ethics or conduct has represented in many cases a useful opportunity to bring public awareness to the threshold of the existence of problems for which there was no exact perception and to settle such awareness into a written text. However, precisely in the dynamic context of technological change, it is necessary to test the idea of a code of ethics or conduct and to raise some problematic aspects that concern the idea of a moral or legal legislation or, in other terms, the idea of soft-law (Durante, 2007, 33-37; Ziccardi, 2009).

To do this, I would like to recall a distinction, developed in the context of moral theory, which was made famous by an American philosopher, Stanley Cavell (2005). Of course, we are not interested, in the present context, in analyzing in detail such a philosophical perspective nor in reconstructing its genealogy, but only in grasping its basic idea. Cavell says that, in the philosophical tradition, we may distinguish two moral basic attitudes: that of the “legislators” and that of the “perfectionists”.

Legislators are those who believe that we should adopt codes of conduct, which provide people with more or less rigid and narrow rules or guidelines that serve us to know what behaviors to keep in concrete situations, in order not to be reproachable. In this perspective, people believe that rules can bring us by themselves to ‘the right’ or at least can help us to avoid ‘the wrong’. This ethical

approach concerns only those subjects that are conceived as legislators that are able to issue moral standards in their full autonomy. This approach seems problematic if it is put into relation to contemporary conceptions of ethics, which puts emphasis not only on the agents, but also and perhaps especially on the patients in a perspective that is no longer strictly anthropocentric (Floridi, 2013). Furthermore, our moral actions seem to display their moral effects beyond the "ordinary standards of proximity" (Putnam, 2008), that is to say, beyond those links that bind together agents and patients and, notably, actions and effects, on the predictability of which any moral or legal legislation is based.

In this context, I need to specify the idea itself of legislation, before clarifying the concept of moral perfectionism. Any legislation, whether moral or legal, is a regulatory system, which competes with other regulatory systems, such as technology, economics, architecture, social norms and others (Lessig, 1999). Today, we are aware of the fact that a given social behavior is unlikely to be regulated by a single regulatory system: most probably, it is the outcome of the contest or competition between different regulatory systems interacting with each other. From this point of view, a legislation (whether hard or soft law) can sometimes prevail over other regulatory systems for the readiness with which it is adopted and implemented (by the time it is adopted, it demands obedience) or because of its legitimization that is the result of a democratic process or of a deep-seated tradition. More often, however, the legislation has an ancillary (or secondary) role with respect to technology. This happens not only because technology evolves more rapidly than does the law or morality, as many tend (not without reason) to repeat. This happens for a subtler reason. There is a fundamental principle that governs all the legal experience (and one could say this about the moral experience as well), enclosed in a Latin formula that says: ad impossibilia nemo tenetur. That is to say, no one is obliged to do what is impossible. Every prescription is applied in the context of what is possible. Nowadays, it is the evolution of the technology that defines the scope of the possibilities in which a legislation can be applied. I would like to bring a concrete example that concerns the legal field. In a recent judgment of the Court of Appeal of Milan, it is stated that the Internet Service Providers (ISPs) do not have an obligation of prior control over the content of communications on the Internet, for which they have offered their services, since there exists no technological automated system that allows one to automatically detect and diagnose in advance potentially illegal content, and for this reason they are not responsible. In other words, since a preventive control is not technologically possible, they are not legally responsible. This reasoning seems to imply that, if such a device were available, ISPs would be judged responsible, and that regardless of the presence or absence of an explicit legal norm setting such an obligation or duty of warrant upon the ISPs. In this case, a technological possibility would create a legal liability. This does not mean that, for example, research related to the semantic web is directed, as such, to create new forms of legal liability. This could only be a side-effect of that research. The example given is telling us something different and more essential, namely that legislation moves today, basically, already in the field of possibilities opened up by technology. After this digression, let us return to our moral perfectionists.

Perfectionists believe that ethics can never be merely reduced to a set of standards or codes of conduct. The foundation of moral perfectionism lies in the idea that "there is a need for something that precedes the principles or the constitution, without which the best principles or the best constitutions are of no value" (Putnam, 2008, 36). Perfectionists do not necessarily have reasonable confidence in the rules and codes of conduct, as in some philosophical tradition, for which the rules never lead by themselves to the right. They believe that they are useful but not sufficient in themselves. They believe, moreover, that ethics is essentially dialogic and relational and, as such, is not necessarily geared to an intended purpose ("it is a process, not a predetermined objective") (Eakin, 2004, 191). For this reason, perfectionists fear that, by merely adopting rules or codes of conduct, we risk to crystallize dynamic relations within general and abstract forms, which are less sensitive to the evolution of the reality to which they should provide guidance. From this perspective, moral perfectionists believe that the adoption and implementation of a code of ethics or conduct can never be separated by the simultaneous overall comprehension of the society and of the time in which this code of ethics or conduct is meant to be implemented (Floridi ed., 2010).

This poses a twofold problem, in respect of any legal or moral legislation (made by a code of ethics or conduct). This problem concerns the way in which to ensure that a given code of ethics or conduct is (1) gradually adapted to the evolution of the ethical problems, and (2) applicable to concrete cases (without being limited to guidelines and general clauses). This is not, of course, a new problem, and for this reason we may refer to the legal experience, to see how this problem has been addressed and dealt with in that context. Experience suggests that a legal text is destined to remain a dead letter, if there is not a living context, within which it can be interpreted, updated and applied to concrete cases. The construction of this (legal) context is more complex, layered and decisive of the construction of the (legal) text. In more explicit terms, historically, the construction of a class of lawyers or judges has been a more complex, stratified and decisive activity than has been the elaboration of the laws. This means that the success and fruitfulness of any code of ethics or conduct depends on the existence of a living and interpretative community or context, in which moral or legal provision (soft or hard laws) are given shared meaning and interpreted in a way that is consistent with the evolution of the society.

The problem of the interpretation, application and updating of a code can be dealt with in theoretical and/or practical terms. From the theoretical standpoint, this requires the construction of an interpreting community and the systematic and comparative analysis of case studies: in this perspective, the task is not only to generalize a number of cases or examples, but also to build knowledge. From the practical standpoint, we need to provide codes of ethics or conduct with periodical revision and updating, and to set arbiters (or other forms of mediators) entrusted with the task of ruling on controversial cases, so that their pronouncement sets, from time to time, the state of the art on the problem at hand. We should not forget that, for example, the development of legal science has

depended, principally, on the heuristic ability of controversial cases to bring out new issues and solutions.

In conclusion, we must be aware of the fact that a moral or legal legislation, adopted by means of codes of ethics or conduct, can offer us clear rules or applicable guidelines, when we are confronted with "soft cases", namely, cases which have been already examined, discussed and settled, and have thereby contributed to the formation of such standards or guidelines. On the contrary, when we are confronted with "hard cases", i.e., cases which admit more than one solution or do not have a clear solution, the codes of ethics or conduct should not be thought of as normative-regulatory systems, which can still serve as a guide for our behavior, but as a discursive-regulatory systems, which set the framework within which we can examine and discuss what is –or is not– ethical to do. In such cases, the possible reference to a Manifesto, which constitutes the axiological foundation of a code of ethics or conduct, is perhaps even more important that the direct reference to the code of ethics or conduct. That is the reason why the adoption of a code of ethics or conduct should be premised upon and coupled with the elaboration and adoption of a Manifesto, which may serve as a shared axiological foundation of such a code of ethics or conduct.

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Hyperhistory and the Philosophy of Information Policies

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Hyperhistory

More people are alive today than ever before in the evolution of humanity. And more of us live longer and better today than ever before. To a large measure, we owe this to our technologies, at least insofar as we develop and use them intelligently, peacefully, and sustainably.

Sometimes, we may forget how much we owe to flakes and wheels, to sparks and ploughs, to engines and satellites. We are reminded of such deep technological debt when we divide human life into prehistory and history. That significant threshold is there to acknowledge that it was the invention and development of information and communication technologies (ICTs) that made all the difference between who we were and who we are. It is only when the lessons learnt by past generations began to evolve in a Lamarckian rather than a Darwinian way that humanity entered into history.

History has lasted six thousand years, since it began with the invention of writing in the fourth millennium BC. During this relatively short time, ICTs have provided the *recording* and *transmitting* infrastructure that made the escalation of other technologies possible. ICTs became mature in the few centuries between Guttenberg and Turing. Today, we are experiencing a radical transformation in our ICTs that could prove equally significant, for we have started drawing a new threshold between history and a new age, which may be aptly called *hyperhistory*. Let me explain.

Prehistory and history work like adverbs: they tell us *how* people live, not *when* or *where*. From this perspective, human societies currently stretch across three ages, as ways of living. According to reports about an unspecified number of uncontacted tribes in the Amazonian region, there are still some societies that live prehistorically, without ICTs or at least without recorded documents. If one day such tribes disappear, the end of the first chapter of our evolutionary book will have been written. The greatest majority of people today still live historically, in societies that rely on ICTs to *record* and *transmit* data of all kinds. In such historical societies, ICTs have not yet overtaken other technologies, especially energy-related ones, in terms of their vital importance. Then there are some people around the world who are already living hyperhistorically, in societies or environments where ICTs and their data *processing* capabilities are the

necessary condition for the maintenance and any further development of societal welfare, personal well-being, as well as intellectual flourishing. The nature of conflicts provides a sad test for the reliability of this tripartite interpretation of human evolution. Only a society that lives hyperhistorically can be vitally threatened informationally, by a cyber attack. Only those who live by the digit may die by the digit.

To summarise, human evolution may be visualised as a three-stage rocket: in prehistory, there are no ICTs; in history, there are ICTs, they record and transmit data, but human societies depend mainly on other kinds of technologies concerning primary resources and energy; in hyperhistory, there are ICTs, they record, transmit and, above all, process data, and human societies become vitally dependent on them and on information as a fundamental resource.

If all this is even approximately correct, the emergence from its historical age represents one of the most significant steps taken by humanity for a very long time. It certainly opens up a vast horizon of opportunities, all essentially driven by the recording, transmitting and processing powers of ICTs. From synthetic biochemistry to neuroscience, from the Internet of things to unmanned planetary explorations, from green technologies to new medical treatments, from social media to digital games, our activities of discovery, invention, design, control, education, work, socialisation, entertainment and so forth would be not only unfeasible but unthinkable in a purely mechanical, historical context.

It follows that we are witnessing the outlining of a macroscopic scenario in which an exponential growth of new inventions, applications, and solutions in ICTs are quickly detaching future generations from ours. Of course, this is not to say that there is no continuity, both backward and forward. Backward, because it is often the case that the deeper a transformation is, the longer and more widely rooted its causes are. It is only because many different forces have been building the pressure for a very long time that radical changes may happen all of a sudden, perhaps unexpectedly. It is not the last snowflake that breaks the branch of the tree. In our case, it is certainly history that begets hyperhistory. There is no ASCII without the alphabet. Forward, because it is most plausible that historical societies will survive for a long time in the future, not unlike the Amazonian tribes mentioned above. Despite globalisation, human societies do not parade uniformly forward, in synchronic steps.

The Philosophy of Information Policies

Given the unprecedented novelties that the dawn of hyperhistory is causing, it is not surprising that many of our fundamental philosophical views, so entrenched in history, may need to be upgraded, if not entirely replaced. Perhaps not yet in academia, think tanks, research centres, or R&D offices, but clearly in the streets and online, there is an atmosphere of confused expectancy, of exciting, sometimes naïve, bottom-up changes in our views about (i) the world, (ii) about ourselves, (iii) about our interactions with the world and (iv) among ourselves.

These four focus points are not the result of research programmes, or the impact of successful grant applications. Much more realistically and powerfully, but also

more confusedly and tentatively, the changes in our *Weltanschauung* are the result of our daily adjustments, intellectually and behaviourally, to a reality that is fluidly changing in front of our eyes and under our feet, exponentially, relentlessly. We are finding our new balance by shaping and adapting to hyperhistorical conditions that have not yet sedimented into a mature age, in which novelties are no longer disruptive but finally stable patterns of "more of approximately the same" (think, for example, of the car or the book industry, and the stability they have provided).

It is for this reason that the following terminology is probably inadequate to capture the intellectual novelty that we are facing. As Bynum rightly stressed, our very conceptual vocabulary and our ways of making sense of the world (our semanticising processes and practices) need to be reconsidered and redesigned in order to provide us with a better grasp of our hyperhistorical age, and hence a better chance to shape and deal with it. With this proviso in mind, it seems clear that a new philosophy of history, which tries to makes sense of our age as the end of history and the beginning of hyperhistory, invites the development of (see the fours points above) (i) a new philosophy of nature, (ii) a new philosophical anthropology, (iii) a synthetic e-nvironmentalism as a bridge between us and the world, and (iv) a new philosophy of politics among us.

In other contexts, I have argued that such an invitation amounts to a request for a new philosophy of information that can work at 360 degrees on our hyperhistorical condition (Floridi 2011). I have sought to develop a philosophy of nature in terms of a philosophy of the infosphere (Floridi 2003; 2006), and a philosophical anthropology in terms of a fourth revolution in our self-understanding—after the Copernican, the Darwinian, and Freudian ones—that re-interprets humans as informational organisms living and interacting with other informational agents in the infosphere (Floridi 2008, Floridi 2010). Finally, I have suggested that an expansion of environmental ethics to all environments—including those that are artificial, digital or synthetic—should be based on an information ethics for the whole infosphere (Floridi 2013). What I have not done but I believe to be overly due is to outline a philosophy of information policies consistent with such initial steps, one that can reconsider our philosophical views of economics, law and politics in the proper context of the hyperhistorical condition and the information society.

Conclusion

Six thousand years ago, a generation of humans witnessed the invention of writing and the emergence of the State. This is not accidental. Prehistoric societies are both ICT-less and stateless. The State is a typical historical phenomenon. It emerges when human groups stop living in small communities a hand-to-mouth existence and begin to live a mouth-to-hand one, in which large communities become political societies, with division of labour and specialised roles, organised under some form of government, which manages resources through the control of ICTs. From taxes to legislation, from the administration of justice to military force, from census to social infrastructure, the State is the ultimate information agent and so history is the age of the State.

Almost halfway between the beginning of history and now, Plato was still trying to make sense of both radical changes: the encoding of memories through written symbols and the symbiotic interactions between individual and *polis*–State. In fifty years, our grandchildren may look at us as the last of the historical, State-run generations, not so differently from the way we look at the Amazonian tribes, as the last of the prehistorical, stateless societies. It may take a long while before we shall come to understand in full such transformations, but it is time to start working on it. Bynum's invitation to "bring philosophy into the Information Age" is most welcome.

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Computer Ethics 2013: From Policy Vacuum to Slow Tech

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Computer ethics and policy vacuum

At the dawn of computer age the questions about social and ethical issues caused by the introduction of computers into the society started to arise. In particular Wiener, one the "founders" of the new era (Turing, Von Neumann, Wiener, and Shannon), introduced the debate about the impact of computers on workers and the related risks of unemployment (Wiener, 1950). Also Parker, one of the leading computer security experts in the 1960s, considered the effects of computers on people, when in his famous article (probably the first publication with "ethics" and "computer" in the title) wrote: "*It seemed that when people entered the computer center they left their ethics at the door*" (Parker, 1968). Indeed the reflection about information technologies was always "after", the technology evolution was never questioned "before". It was Weizenbaum, a professor at MIT, that, for the first time, tried to set some principles for steering the correct application of computers. In his "Moral Laws of the Information Society" he wrote: *1. Human functions that require judgement, respect, understanding, caring and love ought not to be substituted by computers; 2. Applications which have irreversible and not entirely foreseeable side effects, that do not meet pressing human needs, ought not to be undertaken without very careful forethought; 3. IT is a matter of human choice and responsibility.* (Weizenbaum, 1976).

In general, the evolutionary process of technology was considered as a fact, and the role of society as a simple receiver. Since the speed of technology is order of magnitude greater than the speed of society to cope with these "revolutions", then we have a "gap". In the 1980s this is reflected in the first definition of Computer Ethics proposed by Maner: "Computers generate wholly new ethics problems that would not have existed if computers had not been invented ... there should be a new branch of applied ethics ... decided to name the proposed new field Computer Ethics ... a new field that studies ethical problems aggravated, transformed or created by computer technology" (Maner, 1980). It is with Moore that this gap between technology and society enters even in the "core mission" of Computer Ethics: "A typical problem in Computer Ethics arises because there is a *policy vacuum* about how computer technology should be used. Computers provide us with new capabilities and these in turn give us new choices for action. Often, either no policies for conduct in these situations

exist or existing policies seem inadequate. A central task of Computer Ethics is to determine what we should do in such cases, that is, formulate policies to guide our actions …" (Moor, 1985). In this policy vacuum era, nobody questioned the technology in itself: technology changes rapidly our scenarios and we have no policies in these new situations. Technology is considered as "neutral" and not the result of complex interactions with society. The detail that technology is the result of human choices is not on stage.

Towards Slow Tech

In the second half of the 1980s this assumption about "neutrality" is deeply questioned. For example Deborah Johnson wrote: "*Recognition that technology is not just artifacts, but rather artifacts embedded in social practices and infused with social meaning, is essential to understanding the connection between Ethics and IT*" (Johnson, 1985). If computer systems and information and communication technologies are "socio-technical systems", then we have the opportunity of steering them in some way, and not passively accepting their (negative) impacts on society.

This reflection was at the core of the debate between researchers, teachers, computer scientists, and computer professionals about the role of Universities in preparing the next generations of computer experts. This was also the reason for the establishment of the IEEE/ACM joint committee for defining the new Computing Curricula. As a result, for the first time, Computer Ethics was included among the required subjects for Computer Science (Turner, 1991). Also in Europe this debate started and there were several attempts for embedding ethics in ICT curricula (Duquenoy et al., 2010).

A clear definition of the new role (and responsibilities) of computer professionals in the Information Society is due to Lessig. With his model based on four poles (market, law, education, and architecture) for the governance of complex systems, and in particular with his dazzling "*code is law*", he made a fundamental contribution to the recognition of the basic role of computer experts in designing the socio-tecnical systems of the future (Lessig, 1999). This means that, since we have a responsibility in designing computer systems, then we can (or should) steer them in the right direction. But what is the right direction? Floridi proposes a contribution with his analogy between *suffering* in the biosphere and *entropy* in the Infosphere. He defines a form of ethics that he calls Information Ethics: "*... What is good for an information entity and the infosphere in general? This is the ethical question asked by Information Ethics*" (Floridi, 1999).

In this direction, we can start investigating the *good side of ICT.* We can start defining a *good ICT* as a collection of systems and processes that should serve people and society because, according to De George, "*Computers and information technology should help and serve people and society. Where they do not, they should not be passively accepted*" (De George, 2003). We can start providing guidelines for designing systems that are "hospitable", human-aware ICT that can enhance the well-being and well-living of persons and communities, respect the principles of universal access, network neutrality, and 'habeas data' (privacy-by-design). Systems that show high reliability in life-

critical applications, preserve human identity and integrity, and where human-computer interactions are designed taking into account human limits. Participatory design and technology assessments become mandatory for minimising the risks related to complex software systems (Rogerson and Gotterbarn, 1998; Gotterbarn, 1992).

In XXI century we should also take into account the limits of the planet, so we can introduce the definition of a *clean ICT*, bearing in mind the whole ICT lifecycle. We have to recognize that high tech generates toxic hazards throughout its entire lifecycle (design, production, consumption and disposal). So we should consider the environmental impact of materials involved, chip manufacturing processes, power consumption of data centres and devices, ICT applications, e-Waste management and e-recycling. We can start investigating the possibilities of an ICT sustainable-by-design.

We should also realise that there are many stakeholders involved throughout the whole ICT value chain who have very different interests, and that there should be a balance among the interests of all the stakeholders (including the workers and the planet). We can call this a *fair ICT*: an ICT that involves the full set of stakeholders, theirs lives, their dignity, and their rights.

We propose a "bridge" with the Italian (and now worldwide) Slow Food movement that has its roots in the three principles: *good*, *clean*, and *fair* related to food (Petrini, 2011). We propose to steer the digital revolution towards a new kind of ICT, by designing and developing technologies that are good, clean, and fair. An ICT that is human-centred, and that takes into account both the limits of the planet and those of human beings. We propose to call it *Slow Tech:* a *good, clean and fair ICT* (Patrignani and Whitehouse, 2013). We propose to develop the principles of Slow Tech in research and teaching activities in Universities by including Computer Ethics in Computer Science and Engineering curricula, and to embed them into a *Code of Ethics* for computer professionals.

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An Important Issue of Computer Ethics

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In my opinion, the most important of the issues related to the ethics of the computer concerns the access to physical and intellectual resources.

A significant example is the connection to Internet through the physical infrastructure of the network that is often owned by private companies. In our country, few years ago, it was decided to privatize the public company that owned the telephone network and the damage caused by that privatization appears evident even before the possible entrance of Telefonica in the Italian market.

We pay telephone calls much more than the average of other countries. In our country, English, Chinese, Egyptian companies do business by using the telephone network, the result of our collective investment of many decades. Besides, we have closed or downsized major research companies, such as the glorious CSELT, now called TILAB.

The underlying reason for which the privatization was a big mistake resides in the often mentioned, but never fully understood, mechanisms of the so-called "economies of scale". If Bruno was the only one of a group of friends who owns a telephone, his phone would be useless. If Ivo procured a phone, both would make a phone call to the day, in the evening, to coordinate the many activities of AICA. If Juan Carlos bought a phone, every night they would perform three phone calls: Ivo to Bruno, Bruno to Juan Carlos and Juan Carlos to Ivo. If also Raf bought a phone, phone calls per day would become six, because he would add to the three previous calls three new phone calls to Bruno, Ivo and Juan Carlos. By developing the calculations is easy to prove that the number of calls, i.e., the turnover of a telephone company, grows as the square of the number of users.

If Company A has a number of customers equal to 40% of the market, while company B can only count on 20% of the same market, the turnover of A is equal to four times the turnover of B, although customers of A are only twice those of B. Then A can now implement investments that would be precluded to company B. If also companies C and D operated in the market with 20% of the number of users each, in the end only company A would survive. In the market of telecommunications networks, as well as in many other industries, there is room for one operator and only one. If the operator has to be unique, it is best that the state owns that operator, because by definition the government should be closer to collective interest.

One of the tenets of the dominant economic theory states that competition serves the users because it leads to a reduction of prices. It is wrong. If you look up on the roof of the building in front of you, you see the antennas of three or four cellular telephone networks. What is the usefulness of four cellular networks when one can do the job of all? Who will pay the three superfluous networks? The right of access to knowledge is even more important than the right of access to hardware infrastructures.

Old Testament states : "In the beginning was the Word. The Word was with God. And the Word was God ", where clearly the “Word”, the translation of "Logos ", is knowledge. Knowledge is God.

Adam and Eve were expelled from Paradise for stealing an apple from the tree of knowledge. The many millions of patents filed in the international institutions responsible for their collection are many millions of stolen apples from the tree of knowledge.

A Philosophical Revolution without Philosophy

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I would like to defend a quite extreme thesis, that is actually quite reasonable: all problems of the so-called «digital revolution» are philosophical problems, and can be solved by philosophy: by strengthening the role of philosophy in culture, education, and scientific research.

People who have a hammer see nails everywhere, one would say. Which means: I am a philosopher, so I see philosophical problems everywhere. But it is not exactly so. Actually, I have to add another thesis: possibly, the most serious problem of contemporary digital world is that *what we call 'philosophy' is utterly, and perhaps irreparably, incapable of solving the problems it is expected to solve*. So there is no hammer. I doubt having it, and I suspect that no 'philosopher' strictly speaking has it. The world needs philosophy, in a reasonable sense of the terms, but there is no philosophy, and what usually goes by this name has poor or no relation with what a useful science of this sort may be.

What makes the situation especially problematic is the fact that my first thesis is simply true, and also easy to be confirmed. In fact, I am not the only person who claims it. The digital and informational revolution of recent times can be seen as a successful result of the effort accomplished by human species to dominate its most typical and profitable resource: *knowledge*, which in the 19th and 20th century had become a totally uncontrollable feature. The reasons are well know. During the 19th century and the first half of the 20th human beings were witnessing the impressive development of science, as well as the first historical triumph of democracy (people for the first time were becoming protagonist of history). This was, as it were, *a realization of the philosophical dream*: knowledge for everyone, any member of the human species ideally able to get the truth in any sort of subject; any individual able to say to an emperor or a Pope: 'no, this is not true', 'no, this is unfair'.

Yet the dream was slowly destroying itself. Because none could face the enormous amount of givens provided by the specialized sciences (and this was already clear at the end of the 19th century when Wilhelm Dilthey wrote «the world is venturing into a dreadful intellectual anarchy»); and none could face the disastrous effects of the mass-media revolution, joined to the fortune of capitalism, in the central decades of the 20th century (and this became utterly clear at the middle of the 20th century, when Theodor W. Adorno denounced the

self-destruction of reason «the completely enlightened world shines under the sign of triumphal catastrophe», and the definitive defeat of any critical sense in the consumer culture). So in the late modernity, for the first time in history, people had the right to search for truth and justice by their own, and to decide in virtue of their knowledge of facts; but eventually they could not do this, as the growth of scientific knowledge was excited and dispersed, and the informational and seductive power of media promoted the systematic triumph of manipulation and deceit.

The digital revolution has been a brilliant way to solve the problem, limiting if not correcting the damages of the «intellectual anarchy» and «triumphal catastrophe» produced by the democratization of reason. There is no need to espouse the cause of cyber-democracy, to acknowledge that the impressive amount of givens that can be controlled by each individual in the digital world nowadays was scarcely imaginable just ten years ago. The anthropological hypothesis connected to the word 'philosophy' – the creation of a scientific and democratic humanity, whose individuals would have been critical, aware, and happily able to join knowledge and virtue, truth and good – could be pursued again. The computerized society had the opportunity of realizing a true democracy of reason.

But any medicine, as far as knowledge is concerned, is also a poison. So we arrive at the problems of digitalized world. The increasing of information, together with the widest diffusion of givens and communicative opportunities, has posed again the classical problem of any democracy of knowledge: the difficulty of discriminating truth and falsity, good and bad products, or discovering and combat unfairness, or also distinguishing the true (intellectual as well as moral) value of enterprises and proposals, in the disperse and complex world of hyper-informational society. Again the species is facing the classical move from the democracy of reason to the destruction of reason.

It is quite easy to see that the underlying problems were and are philosophical. They consist of the difficulty of using high-order concepts, such as truth, existence, justice, freedom, identity, etc., that are the basic functions of any human reasoning, and namely are the so called «old glories» of philosophy (like John L. Austin once wrote). Not by chance, a specific intellectual practice called 'philosophy' arose in the ancient Greece just to solve the difficulties related to the uses of these concepts in open and excited democratic debates. In a democratic life anyone is supposed to be able to search for truth, to defend justice and to know the difference between what exists and what does not exist, but evidently in such a situation anyone may fail in doing all this, and what's worse: may made to fail. This is the reason why a certain competence about the traps hidden in the use of these concepts is extremely useful. We see that our problem is always the same: if we want a scientific, and democratic world (a world grounded on knowledge, and that particular connection of freedom and justice that we call democracy), we need philosophy. Here is then the second part of the thesis: the need of wide circulation and improvement of philosophy as critical and aware competence concerning the fundamental features of human thought and reasoning.

The philosophy that we are talking about reminds us in a fairly obvious way of the notion of «first philosophy» specified in Aristotle's books *metà tà physikà*, where Aristotle present the idea of «first science» (substantially equivalent to what we call 'philosophy'). And this substantially was Aristotle's idea: a general and preliminary competence concerning the basic features of human rationality. About this «science» three points should be specified. First, its width and generality do not exclude specialization: in fact (so Aristotle stresses) the «first science» is simply the specialized science of the first and general principles of human thought when it is engaged in reasoning, and deciding, and acting consequently. So its developments, and research, involve specific competence, and specialized study. Second, the fact that this science is important for any human being does not mean that all human beings must be 'philosophers' in scientific and professional sense, simply means that a strong and clear basis of first philosophy is needed for the education of humans, like a strong and clear basis of mathematics is needed for any kind of human activity. And third, the fact that this competence is 'first', and the science that provides it is the «first science», does not mean that there is any true dominance or encyclopaedic primacy of philosophy over other sciences. This was Hegel's mistake: philosophy (or rather first philosophy) is simply the basis of any sort of knowledge and human practice, because having a certain (basic) philosophical competence is of extreme utility, especially in a scientific, globalized and globally democratic world.

But here is the problem: such «first philosophy» simply does not exist. *There is no philosophical discipline nowadays that corresponds to something in some way similar to «first science»*. This makes us see well the obvious truth of the second thesis. There is no 'philosophy' in the sense in which this term should be profitably and reasonably intended, nowadays. And what's more: very few philosophers share this account of the present times, and those who try to reflect on the possibility condition of a new first philosophy, or try to practice it, usually are not understood, or are simply under-evaluated and misinterpreted.

A good 45% of philosophers, actually, is fiercely enemy of science and hold that to accomplish its commendable task of *magistra scientiae et vitae* philosophy should not be a serious science, like any other, but must conceive itself as a sort of narration or generic intellectual conversation about noble sentiments, or an informed though amateurish presentation of the joys of culture and values, and of the past splendours of logos. Another 45% holds instead that the idea of such a «first science» is simply absurd and irrelevant, namely conceived by the enemies of science, or corresponds to an old pre-scientific fantasy of alchemists and idealists.

And the 10% remaining? I think it gathers, though with many uncertainties, the group of those who share the two theses, and try, as far as they can, and despite the fierce resistance of preponderant adversary forces, to spread the practice of first philosophy (and the need of it), in a cultural and scientific environment that is substantially hostile.

The good news is that the 10% position seems to be quite shared, nowadays. Few philosophers but many among scientific operators, politicians, artists,

economists, literary men, seem to acknowledge: that to get to the bottom of small local problems you need 'think big'; that to understand the Earth you need to look at heavens (in a quite systematic way); that universality is the height of concreteness, while particularity is inevitably abstract. And they acknowledge this without having studied Hegel or other similar philosophers.

Nowadays the system of informational processes is experimenting forms of self-understanding and self-regulation that would not be wrong to call philosophical in loose sense. And also computer science, as well as other so called «hard» sciences, are now recuperating the ancient Socratic theory of the intersection of intellectual and moral values. All this is accounted for by the Philosophy of Information developed by Luciano Floridi, and by other people (belonging to the 10%). But also sectors of the research that do not have any specific philosophical competence are interested in it.

In other words, the digitalized world is slowly but unequivocally becoming a philosophical world. And this happens against and despite the resistance of "philosophers" who, fortunately, are not listened so much.

Steps Towards a Code of Ethics for Italian Computer Professionals

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Since 2010 AICA has setup a Working Group named "Progetto ETIC, Etica e Tecnologie dell'Informazione e della Comunicazione" with the goal of investigating the social and ethical impacts of information and communication technologies (ICT) and, among the others, with the ambitious goal of developing a Code of Ethics for Italian Computer Professionals.

The process will be open and inclusive and will involve the entire Italian community of ICT stakeholders through the network of contacts of AICA.

The event in Torino on November 2013 can also be seen as the first event dedicated to this goal and the starting point of this process.

It is also interesting to note that, independently, at continental level, also the Council of European Professional Informatics Societies (CEPIS) organization started exactly the same discussion about the need to define, at least, a "*framework for a Code of Ethics*" that can be useful as a base for all national societies like AICA. Then the proposals coming from National Societies can ask for a CEPIS "stamp".

On March 13th 2014, CEPIS organized a meeting dedicated to Professional Ethics at its Headquarters in Bruxelles. The objective of the event was "*... to look at the activities that CEPIS can undertake to support its Member Societies in the field of ethics, as well as to raise awareness on this issue at the level of the European Commission". Also from the meeting report released by CEPIS: "... participants agreed on the need for a European approach towards professional ethics. It was agreed that it wouldn't be possible to have one single Code of Ethics for all European countries. However CEPIS could develop a European framework for Codes of Ethics, i.e. a list of common principles and elements that each Code of Ethics should include. There could also be a CEPIS stamp of approval for Codes of Ethics that meet such principles and elements*".

It is also worth mentioning the conclusions of this CEPIS meeting:

"*Promoting IT Professionalism is not about protectionism, but is really about how we, as IT Professionals, approach the world. What impacts society is not IT skills per se, but how IT skills are used; as IT Professionals, we have a duty of care to society, and IT Professional Institutions in turn have a duty to equip their members with tools and resources to inform and educate them about how to make tough, but informed, judgements and decisions in this context.*

The aim of IT Professional Ethics is never to be self-serving, but to be other-serving. An IT Professional Code of Ethics informs society about what it can expect from IT Professionals.

CEPIS, as the intra-organisational body for IT Professional Societies in Europe, in cooperation with its members, will:

- *Publish a statement of "Professional Aspiration" for European IT Professionals; such a statement can be used as a template by Professional Institutions seeking to establish their own codes of ethics.*
- *Provide a repository of ethical tools, techniques and case studies*
- *Engage in advocacy with national and European bodies about the importance of IT Ethics within IT Professionalism; there is a need to start education on ethics at the earliest stage, and to equip educators with supports for discussion of the ethical implications of IT.*
- *Engage in advocacy with industry, educators and institutions on the importance of ongoing learning; computing responsibility and professional impact are areas that constantly raise new questions.*
- *Create arenas for continued discussion on ethics; in particular, the importance of ethical governance, and ethical case studies for developing ethical thinking.*
- *Promote the concept of "Digital Wisdom" to complement that of "Digital Literacy"*
- *Engage in ongoing gathering of feedback; from member societies, industry and national and international bodies."*

The AICA Working Group named "Progetto ETIC" will put forward this process with the collaboration of all interested members, Italian computer professionals, and all interested stakeholders of the Italian ICT community.

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