Slow Tech: The Bridge between Computer Ethics and Business Ethics

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Abstract. This paper addresses the difficult task of implementing the concept of Slow Tech, that is, information and communication technology (ICT) that is good, clean and fair, in a business environment. It investigates the democratic, environmental, and social challenges currently facing ICT vendors. More specifically, it examines the opportunities available for these companies to use Slow Tech as a bridging mechanism between their Computer Ethics and their Business Ethics strategies, based on Corporate Social Responsibility. Last but not least, it highlights what some "next step" questions for further investigation and implementation might be and the challenges of implementing these.

Keywords: Business Ethics, Computer Ethics, Corporate Social Responsibility, Information and Communication Technology (ICT), Slow Tech.

1 Introduction

Today, internationally as well as in Europe, large-scale corporations are getting ready for the next phase in social, economic and environmental developments by preparing appropriate corporate social responsibility strategies. Information and communication technology (ICT) vendors are a specific case in point: they sell large quantities of technologies which are currently helping to re-shape society through resulting significant social and environmental changes.

Largely in response to policy and regulatory changes, some large ICT companies are now filing social and environmental balance sheets in addition to completing their annual financial reports. However, very few ICT vendors currently consider the computer ethics side of their businesses even while they are beginning to adopt the notion of corporate social responsibility: even fewer undertake social and environmental audits of the ICT that they sell. For the sake of consistency, ICT vendors should begin to examine their own business and investigate the specific ethical, environmental and social impacts of the products and services they provide to their customers.

Thus, this paper suggests that ICT vendors should be among the first companies that start to develop an applied ethics that examines the ethical challenges related to

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computers, i.e., computer ethics. It proposes Slow Tech as a tool to facilitate companies' efforts to analyse the ethical, environmental, and social impacts of the ICT that they design, develop, produce, and sell. Whenever business ethics is used as a form of applied ethics that examines the ethical challenges that arise in a given business scenario, Slow Tech is able to provide a suitable bridge between those computer ethics and business ethics.

The paper is structured so as to introduce Slow Tech as a concept, and describe briefly its relationship with Slow Food. This introduction is followed by a discussion of the role of computer ethics and business ethics in today's society. In particular, the paper outlines the relationship between business ethics and corporate social responsibility. It then examines the formal annual reporting processes of ICT vendors: it shows how these vendors are increasingly responding to requests to make public their corporate social responsibilities, and yet are still doing so in quite limited ways. It highlights a number of important challenges for the ICT industry, and indicates in what way this industry might take a number of steps on the journey to becoming more Slow Tech. While the paper takes an optimistic view of the opportunities that lie ahead, it does not shirk from facing the challenges that are implicit in beginning this new way of thinking and acting.

2 Slow Tech and Its Parallels to Slow Food

Some forms of Slow Tech have been around for at least a decade (Hallnäs and Redström, 2001; Price, 2009). These earlier approaches either considered designing Slow Tech to be about the creation of periods of reflection and mental rest (Hallnäs and Redström, 2001) or they focused on the need for robust engineering practices (Price, 2009). Since 2010, the Slow Tech notion has been further revised and refined (Patrignani, 2010; Patrignani and Whitehouse, 2013).

Today, Slow Tech is being re-formulated as a concept that invites people to reflect on the social and environmental impacts of ICT (Patrignani and Whitehouse, 2013; Whitehouse and Patrignani, 2013). It encourages concentration on the entire technology value chain, i.e., the whole chain of activities performed to create ICT products and services. This contemporary version of Slow Tech proposes that ethical ICT should have three characteristics: it should be *good*, *clean* and *fair*. There three terms - good, clean and fair - explicitly replay the Slow Food movement's appeal to reflect on the whole food-chain, so as to ensure that food should be: of *good* quality, *clean* (it should respect the environment, promote biodiversity and sustainability) and *fair* (i.e., the cultivation and production of food must respect the rights of farmers) (Petrini, 2007; 2011). In other words, *good* ICT is based around notions of human-centredness, user involvement, participatory design, enjoyment, aesthetics, and a balance between work and home life. *Clean* ICT means taking into consideration the environmental impacts (such as materials and energy consumption) of the manufacture, use and disposal of ICT products. *Fair* ICT means ensuring fairness and equity of the conditions of workers throughout the entire supply chain. Detailed

explanations of the basics of Slow Tech are outlined in other papers (Patrignani and Whitehouse, 2013; Whitehouse and Patrignani, 2013).

Slow Tech should not be misunderstood as an appeal necessarily for technology to "go slow". Rather, in terms of the ICT industry, it should be seen as a plea for its these three aspects of concern - goodness, cleanliness, and fairness - to be viewed holistically rather than each being addressed in very different ways, and separately. Slow Tech should be viewed as a proposal to look at ICT in a new, more holistic, manner that represents an innovative approach to technology for the 21st century.

3 Computer Ethics and Business Ethics

In terms of the holism with which ICT should now be regarded, it is important to examine both computer ethics and business ethics. While a trend against technological determinism was already evident in the 1930s, these two ethical domains, computer ethics and business ethics, have developed most swiftly since the 1970s over a similar time-horizon although largely separately. These two ethical domains show certain similarities: in particular, their current focus is on stakeholder collaboration and the co-shaping of technology and society by people themselves.

On the one hand, computer ethics has possibly been more limited in its sphere than business ethics. While academe has shown considerable interest in it, at least some computer societies have applied its principles. On the other hand, business ethics has been taken up rather more obviously: this is perhaps due to its commercial setting or because of the many ethical and behavioural weaknesses in business that have been so publicly pointed out over the last decade and a half. This uptake has occurred on the part of at least three distinct sectors: academe, business organisations and associations, and policy fora.

Now is the time to examine the similarities and synergies between the two fields of ethics and, as appropriate, to bring the two forms of ethics together. This section of the paper concentrates on a comparison of computer ethics and business ethics.

Computer Ethics

Writing in rejection of technological determinism was evident at least since the 1930s on the part of several philosophers and social scientists. See, for example, the work of such writers as Lewis Mumford and Jacques Ellul (Mumford, 1934; Ellul, 1954). Yet, it was Norbert Wiener - a professor at the Massachusetts Institute of Technology (MIT) - who was probably the first scientist to reflect on the social and ethical impacts of computers, with his recommendation to shift "from know how to know what" (Wiener, 1950). The first research engineer to follow up on Wiener's ideas was Donn Parker with his *Rules of Ethics in Information Processing* (Parker, 1968). Joseph Weizenbaum, another professor at MIT, described the risks related to the use of computers for military applications (Weizenbaum, 1976). However, the term "computer ethics" was used for the first time in 1978 by Walter Maner in his taught course, the notes from which were eventually published as a *Starter Kit in Computer Ethics* (Maner, 1980). A later description of computer ethics was introduced by James

Moor (Moor, 1985). It was based on a perceived lack of policy and guidance in terms of the use of computers: "*... there is a policy vacuum about how computer technology should be used. ... 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, p.1). This description of computer ethics was focused on the end-uses of ICT and on the social and ethical implications of this use. At this period, some 30 years ago, the role of the ICT industry - itself at the very core of the information technology development process - did not appear to be questioned. Following the work of Deborah Johnson, which took place around the same time, it was, however, realised that "*... technology is not just artifacts, but rather artifacts embedded in social practices and infused with social meaning*" (Johnson, 1985, p.16). This shift in thinking enabled a new way of looking at ICT systems as socio-technical systems: a context in which technology and society shape each other. This focus on co-shaping means that people have the opportunity to steer technology developments in different directions: they are not bound by a framework of technological determinism.

It is precisely in the field of computer ethics that Slow Tech can play a fundamental role, by creating a positive form of computer ethics rather than one which has a negative orientation. Slow Tech offers a potential enlargement of the scope of analysis, and application, of computer ethics by including the entire ICT value chain: thus, it covers both the development process of ICT as well as its use. Slow Tech's view of ICT ranges from the extraction and processing of raw materials, and ICT manufacturing processes, through to responsible renewal, recycling and disposal. The supply chain does not start in the warehouse or the store. This stance is particularly valid for ICT vendor organisations because, today, they are the main actors involved in designing, developing, producing, and selling computer technologies.

Business Ethics

The classical definition of business ethics is "*... the applied ethics discipline that addresses the moral features of commercial activity*" (Marcoux, 2008). This form of applied ethics tries to provide answers to such difficult questions as: "Is the corporation a moral agent? How and in whose interests ought the corporation to be governed?" In terms of the establishment of its associations and societies, business ethics has appeared only relatively recently on both sides of the Atlantic. The Society for Business Ethics was founded in the United States in 1980 by Richard De George, while in Europe the European Business Ethics Network was launched in 1987.

Yet, for at least the last forty years, a vigorous debate has taken place in both American and European business schools about the role of the corporations in society. On the one hand, the work of Milton Friedman was concentrated on shareholder theory, in which the mission of the corporation is to maximise profit for a company's shareholders (Friedman, 1970). On the other hand, Edward R. Freeman's work was based on stakeholder theory, where business ought to be managed in such a way that it achieves a balance among the interests of all who bear a substantial relationship to the firm - the firm's stakeholders. According to Freeman (1984), the purpose of the corporation is its joint service to its stakeholders.

However, discussion about computer ethics and business ethics does not only take place in business schools. A parallel discussion has been conducted in the business world, and has been articulated in the field of European and international policy: it is called corporate social responsibility.

4 Corporate Social Responsibility

Corporate social responsibility is a form of corporate self-regulation, that is integrated into a company's business model. In other words, the policy of corporate social responsibility functions as a built-in, self-regulating mechanism that ensures compliance with prevailing legal and ethical standards and international norms (Wikipedia, 2014a).

Corporate social responsibility is in line with stakeholder theory, since it includes all those entities, groups and individuals on whom a corporation has an impact. It enables a profile to be drawn of the effects that a corporation has beyond its own shareholders. This wider, holistic picture includes employees, consumers, communities, and the environment. It is for this reason that the proponents of corporate social responsibility argue that organisations with this perspective are more able to make profits in the long-term. If a company that embraces a business ethics approach is willing to examine the ethical challenges that likely to arise as a result of the business scenarios that it is applying, then two actions will occur. It will extend its concerns beyond the strict interests of its shareholders, and it will have a strong corporate social responsibility strategy.

A number of policy bodies have taken up this concern with corporate social responsibility. This movement can be seen both in Europe, in the work of the European Commission, and more widely internationally in the context of the International Organization for Standardization (ISO). A preoccupation with corporate social responsibility has been present in European policy for over a decade. In the five-year period at the start of this century, the European Commission published two relevant policy documents (European Commission, 2006; 2011). More recently, the Commission has tightened up its concept of social responsibility relative to its earlier definition. In a 2011 Communication, it defines it directly as "*the responsibility of enterprises for their impacts on society*" (European Commission, 2011, p.6). This policy document also states that, to fully meet their social responsibility, enterprises "*... should have in place a process to integrate social, environmental, ethical human rights and consumer concerns into their business operations and core strategy in close collaboration with their stakeholders*" (Op cit, 2011, p.6). This Communication includes a set of eight recommendations, which range from awareness-raising to international discussion and collaboration. They form a list of corporate social responsibility guidelines or clauses. Similar statements occur in the ISO's voluntary guidelines, ISO 26000, launched in 2010 (ISO, 2010). Among others, these include:

- *principles of social responsibility* (accountability, transparency, ethical behaviour, respect for stakeholder interests, respect the rule of law, respect for international norms, respect for human rights);

- *fundamental practices of social responsibility* (recognising social responsibility, stakeholder identification and engagement);
- *social responsibility core subjects* (human rights, labour practices, the environment, fair operating practices, consumer issues, community involvement and development) (ISO, 2010).

Even though these guidelines are voluntary in character, they are beginning to influence the ways in which international, large-scale businesses view the importance of their corporate social responsibility.

5 ICT Vendors and Corporate Social Responsibility

ICT vendors constitute a specific category of firms within this corporate environment. They have a major influence over the shaping and co-shaping of the digital world in which a considerable proportion of the population of the planet currently lives. ICT vendors are members of a group of organisations that need to examine - in conjunction with all businesses - their business ethics generally. In addition, given the corporate sector in which they operate, they also particularly need to explore their computer ethics. This dual approach to both business ethics and computer ethics forms an integral part of ICT businesses' corporate social responsibility.

Given the growing importance of corporate social responsibility, 2014 provides an opportune moment to explore how this strategy is handled by ICT vendors. If an ICT vendor would like to develop a coherent and consistent corporate social responsibility strategy based on the triple bottom-line approach of "*profit, people, planet*" (Spreckley, 1981; Elkington, 1997; ORSE, 2010), then computers - or ICT in general - will have to be included in any analysis of the company's own behaviour.

The ICT market is made up of various components: it includes, among others, hardware, software, ICT services, networking devices, social networks, and e-commerce sites. This market is one of the most important at the global scale. In 2013, its value was estimated to be around 3,700 billion US dollars: in the 12-month period since, it has seen a slight increase of +4.2%, despite the financial and economic crisis (Gartner, 2013). The world's ICT companies have experienced a strong process of consolidation over the last decade. The few remaining competing firms have become, or are in the process of becoming, global giants. The 2013 ranking of ICT companies in terms of their revenues shows that the main ICT vendors are corporate behemoths. Table 1 shows the largest ICT vendors in terms of their 2013 revenue (Forbes, 2013), together with the official documentation related to their corporate social responsibility strategy.

For ICT vendors, it is clear that one critical success factor could be to articulate a strategy that stipulates their corporate social responsibility. The publicly available documentation of the largest international ICT companies (cited in Table 1) indicates that, for the majority of these corporations, corporate social responsibility means only developing a number of generic activities relating to social concerns, for example, by funding projects in various charitable areas. These companies appear to report very little activity that would have a direct impact on their responsibilities in terms of the ICT sector itself or that would address the very specific social and environmental challenges posed by their own companies in relation to ICT.

Table 1. Corporate Social Responsibility Reports in 2013 - Main ICT Vendors

Corporate Social Responsibility Reports in 2013 - Main ICT Vendors

Company	*Revenues*[1]	*CSR public documentation*
Samsung	*187.8 B$*[2]	*Sustainability Report 2013 (Samsung, 2013)*
Apple	*164.7 B$*	*Supplier Responsibility at Apple (Apple, 2013)*
HP	*118.7 B$*	*HP Global Citizenship Report (HP, 2013)*
IBM	*104.5 B$*	*Corporate Responsibility Report (IBM, 2013)*
Sony	*78.5 B$*	*Annual Report 2013 Business and CSR review (Sony, 2013)*
Microsoft	*72.9 B$*	*2013 Citizenship Report (Microsoft, 2013)*
Amazon	*61.1 B$*	*Amazon Smile (Amazon, 2013)*
Dell	*56.9 B$*	*The Dell 2020 Legacy of Good Plan (Dell, 2013)*
Intel	*53.3 B$*	*Intel 2012 Corporate Social Responsibility Report (Intel, 2013)*
Google	*50.2 B$*	*Who we are - Corporate Social Responsibility (Google, 2013)*
Cisco	*47.3 B$*	*Corporate Social Responsibility (Cisco, 2013)*
Oracle	*37.1 B$*	*Corporate Citizenship Report (Oracle, 2013)*
SAP	*20.9 B$*	*Corporate Social Responsibility (SAP, 2013)*
Facebook	*5.1 B$*	-[3]

1. Source: (Forbes, 2013)
2. B$ represent a billion US dollar (1,000,000,000 USD)
3. The authors were unable to find ant official report or documentation about Facebook's strategy on CSR. This may be due to the relative youth of this company (Bacile, 2013), which was founded a decade ago in 2004. Yet the lack of a CSR strategy is also surprising since, by September 2012, it managed a social networ k of more than one billion users (Fowler, 2012).

While it is difficult to consolidate a single view of these very different companies in terms of their corporate social responsibility strategies, it is obvious that it is becoming more and more important for them to show - with a degree of transparency - to both their investors and their customers the factors that contribute to their economic results.

Some large ICT vendors - in particular in the ICT manufacturing area - do have their own codes of conduct. For example, the Electronics Industry Code of Conduct, a non-profit corporation established in 2009, states that it "*was established to ensure worker safety and fairness, environmental responsibility, and business efficiency*" (EICC, 2012, p.1). However, two years after the code was set up, many limitations were still found to these approaches due to the general lack of international standards, the low level of commitment, and a lack of verification and enforcement mechanisms (Martinuzzi et al., 2011). e-commerce sites and online retailing, as industries, have been scrutinised from an ethical perspective (Agag and Elbertagi, 2013). This study's findings demonstrate the importance of business ethics and corporate social responsibility for companies "*... ethical problems like security, privacy, reliability, non-deception and corporate social responsibility on [sic] Internet are core issues that limit the growth of online retailing*" (Op cit, 2013, p.15).

As can be seen from the above discussion, ICT vendor corporations have a special accountability in terms of society and the planet. Thus, their reporting should take a step beyond the traditional corporate social responsibility reporting of companies in other industries. In their corporate social responsibility strategy or, more generally, in their business ethics strategy, ICT vendors should also incorporate a computer ethics strategy. Presumably, developing such a stance on corporate ethical and social

concerns would help them to improve the companies' performance, growth and profitability.

6 Slow Tech as a Bridge: Good, Clean and Fair ICT

Slow Tech is proposed as a tool for bridging the two fields of computer ethics and business ethics. It could ensure the incorporation of appropriate corporate social responsibility codes and behaviours for ICT vendors.

How precisely can Slow Tech (*good*, *clean*, and *fair* ICT) help ICT vendors in their definition of their triple bottom line (ORSE, 2010)? How can Slow Tech help in bridging business ethics and computer ethics? It can do so at three levels: it brings together in a succinct and straightforward manner the three notions of good, clean and fair with those of profit, planet and people. In Figure 1, a representation is provided of Slow Tech as a possible bridge between computer ethics and the classical corporate social responsibility triple bottom lines that are embedded in business ethics.

Figure 1 acts as a reminder that the basis of computer ethics has traditionally been about the use of ICT. Slow Tech widens that limited scope to explore the whole of the ICT value chain. The diagram shows that both Slow Tech and business ethics - in which corporate social responsibility is implicitly included - outline a trio of concerns. For Slow Tech, this triad is based around the three notions of good, clean and fair. The three notions incorporated in corporate social responsibility are profit, people and planet. In this figure, therefore, good ICT can be equated with the capacity to make a long-term profit; clean ICT is linked with the planet; and fair ICT is associated with people. Each of the three sets of relationships are explained below in more detail.

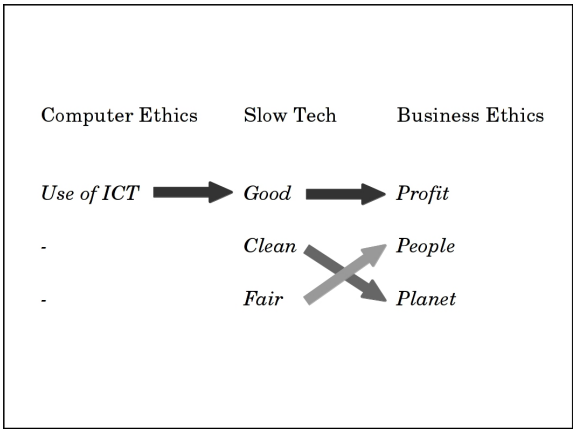

Fig. 1. Slow Tech as a Bridge between Computer Ethics and Business Ethics

Good ICT and Profit

Starting from the creation of a bridge between the ability to make a profit in the long-term - and hence to maintain financial sustainability - with a good form of ICT, good ICT is an ICT that should be human-centred. Thus human-computer interaction, and participatory design are the core starting requirements in ICT design. Good ICT should be designed by using either a design-for-all or an inclusive approach. Good ICT can therefore be associated with profitable i.e., financially sustainable ICT.

ICT that is desirable, and yet also financially sustainable, requires a continuous investment in innovation. Organisations that would like to stay at the forefront of ICT innovation need to design high-quality and advanced products. This ambition requires a considerable investment in knowledge-workers. Most ICT companies are aware that, in terms of achieving success, their work is founded on knowledge intensity, human capital, and investments in research and development (Martinuzzi et al., 2011). Being innovative means being able to attract talented personnel from around the globe, as part of those large industrial clusters and cooperative networks that include universities and research centres.

Innovation in ICT means being ready to develop a continually updated research agenda. In 2014, for example, it should include such areas as: Big Data, Intelligent System and Decision Support Systems (for which data scientists will be people highly requested by companies), Cloud Computing and Internet of Things (that aspect of the cloud based on the use of sensors), Information and Knowledge Management (the new web or network science), Organisational Models and Information Systems (which offer new roles for Chief Information Officers), Mobility (in which the vehicle, such as a car, is the computer), and Human-Computer Interaction (which might eventually mean bidding farewell to computer keyboards).

Clean ICT and Planet

For an ICT vendor, creating a bridge between clean ICT and the planet means undertaking a profound analysis of the impact of both hardware and software production, and their use and disposal. This clean approach takes into account those limits to growth that result from the limits of the planet (Meadows et al., 1972). Indeed the ICT sector could play a fundamental role in developing the domain of cleantech, that field of clean technology for which there is not yet any standard definition, yet which can be termed "*any product or services that improves operational performance, productivity, or efficiency while reducing cost, inputs, energy consumption, waste, or environmental pollution*" (Wikipedia, 2014b). Clean ICT could help people to minimise their consumption of conventional fossils fuels, and non-renewable materials (through de-materialisation), thereby reducing pollution. The reduction would occur by applying innovative science and technology and introducing new life-styles and cultural changes, in the long-term.

At the same time, this would mean two approaches: maximising the contribution of renewable resources in energy production by incorporating information technologies in new technological and organisational systems; and finding the most appropriate materials and form of energy by diffusing knowledge of cleantech. More specifically, ICT devices should be recyclable-by-design; their lifetime should be extended and

lengthened; and interoperability standards between modules should be made mandatory.

Last but not least, the rebound effects of ICT should be analysed in-depth and clarified at all three levels of their impact. The first-order effect relates to resource and energy consumption, green-house gas production, and e-waste. The second-order effect to the impact of the continuing use of ICT, de-materialisation, e-procurement, tele-work, transactions speed, and transparency. The impact and opportunities created by the use of ICT by large numbers of people, their productivity, well-being, and lifestyles, are the third-order effect (Yi and Thomas, 2007). Further research is needed on the long-term sustainability of ICT since, as demonstrated in several simulation studies, there is a risk that the positive and negative effects of ICT may counterbalance each other: the rapidity of the development of ICT may induce more material and energy consumption and more e-waste generation (Hilty et al., 2006).

Fair ICT and People

Bridging fair ICT with the needs of people means that an ICT vendor needs to create transparency in the supply chain with regard to its employees' working conditions. In particular, the corporation should pay special attention to human rights. A company needs to ensure that human rights are respected, for examples, in the mines of Africa and those other countries that are the main sources of the materials (such as coltan and the rare-earths) used to build its computer equipment (Vazquez-Figueroa, 2010). It should commit to enforcing the respect of human rights, health, and safety of working conditions in all its suppliers' manufacturing and assembly plants, and ensuring that workers are not forced to undertake monotonous and repetitive tasks, or to work for very low wages. In other types of organisational context, the pressure of the work undertaken by knowledge workers should be counterbalanced by improvements in the quality of the work environment. Fair ICT should also include offering users the opportunity to change their ICT provider through the use of proper "spanning layers" with open interfaces. A fair ICT vendor should not lock its users and developers into "silos" that possess proprietary formats and application programming interfaces (Madrigal, 2012). The growth of the open data, open software, and open hardware movements are three examples of Slow Tech good practices.

One of the main features of Slow Tech as a tool is the improved capability of the corporation to design a complete stakeholders' network. For an ICT vendor this means the opportunity to identify both its downstream actors and its upstream actors. The stakeholders covered include not only those which are present after the vendor's products and service are released onto the market, but also those involved in the extraction and processing of raw materials, and in the manufacture of the ICT products. Key questions for ICT vendors - and for all other stakeholders in the ICT value chain - become not only where the technology itself comes from, but also their social and environmental costs. Being able to ask, and answer, these kinds of questions openly and transparently will initiate a means of approaching an innovative ethical, social and environmental good, clean and fair ICT for the 21st century.

7 Conclusions, Challenges and Next Steps

This paper starts with a discussion of the origin and development of Slow Tech, and its basic characteristics. It argues that Slow Tech can be broadened to provide a means of looking at ICT in a more holistic manner, by taking into account the extent to which the creation and sale of ICT services and products can be characterised as good, clean and fair. Thus, Slow Tech as an approach provides a specific business opportunity for the computer industry, especially for ICT vendors.

ICT vendors' challenge is how to ensure that, when they examine and test their own levels of corporate social responsibility, they concentrate far more than at present on their computer ethics. Thus, Slow Tech provides a tool for developing a more robust and comprehensive business ethics for ICT vendors. It enables them to construct a computer ethics strategy, which focuses on both the end-uses of computers and questions the technology in itself. This paper indicates how a bridge can be built between each of the three following notions: good ICT and profit - i.e., financial sustainability - or the achievement of profit in a financially sustainable way; clean ICT and planet; and fair ICT and people. Slow Tech does this in terms of providing a concept and overview of appropriate business ethics.

Challenges

Of course there are many challenges in building these bridges, both conceptually and in terms of implementation. In conceptual terms, the basic ideas behind Slow Tech mean thinking more holistically, more aesthetically, more sustainably, more democratically in an organisational sense - and ultimately less opportunistically, less egotistically, and less short-term - than perhaps many ICT companies have had the habit of doing. These conceptual shifts may prove to be a challenge for some of the more recently established corporations.

In practical term, the world-wide economic crisis that started around 2007 could shorten the long-term view of many ICT companies and remove the motivation from them to maintain a sound approach to business ethics based on a solid understanding of computer ethics. How can a corporation begin to be willing to go beyond its legal requirements? What would be its first steps? For some companies, led by ethical and social visionaries (see Patrignani and Whitehouse, 2013, for at least three case studies), those steps are already being made. For the late adopters and laggards, other mechanisms are also evident. One way is for companies to realise that the pressure from stakeholders will grow: users, computer professionals, and policy makers, for example, can all steer the markets in appropriate directions. The more often that stakeholders' networks are defined, the more transparency and awareness will grow in society. In any event, transparency may well expand, since interested parties can in any case use social media and Web 2.0 to facilitate the exposure of inappropriate business practices on the part of ICT vendors.

Next Steps

Further investigatory steps are now needed in relation to Slow Tech. Among these are assessments of how corporations can actually answer the questions posed in this

paper: i.e., what kinds of internal processes are needed in organisations; what types of methods should be used; and how do firms interpret and address the three spheres of goodness, cleanliness and fairness. Special attention needs to be paid to how companies not only perceive, but also analyse, their own stakeholder network, and how they can work more closely and intensively with the full range of stakeholders whom their products and services affect - from design to manufacturing, and from sale to use to disposal or re-use.

In Europe (for example, European Commission, 2011), some helpful proposals are being proffered. The anticipated establishment of a European multi-stakeholder platform, in early 2014, might prove especially positive in this regard. Techniques are also being cited that can influence the thinking and acting of those who may not yet be working in the corporate sector but who may still be members of the generation undergoing education and training. Globally, the work of the ISO also offers a means of encouraging the corporate social responsibility that is now needed on the part of ICT vendors (ISO, 2010).

Today's challenges to the production and use of good, clean, and fair ICT, both conceptual and concrete, can of course act as incentives for action: they can further applied research or encourage social activism. Encouraging the study, and the application, of Slow Tech is intended as a deliberate - and positive - first step in this direction.

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