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Expanding ethical vistas of IT professionals

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Abstract: In this paper we argue for an experientially grounded view of IT professionals' ethical formation and support. We propose that for such formation and support to be effectual, it should challenge professionals' conceptualisations of their field and of ethics, and it should do so with the aim of changing their experience. To this end, we present a Model of Ethical IT, which is based on an examination of the nature of ethics and on empirical findings concerning IT professionals' experience of ethics. We argue that for IT professionals to be enabled to become more ethical in their practice: the purpose of IT must be primarily understood to be user-oriented; the nature of professional ethics must be primarily understood to be other-centred; and the goal of ethics education must be understood as primarily promoting a change in awareness.

Keywords: Information technology, professional ethics, professional formation

1 Introduction

This paper argues for a new approach to IT ethics professional formation and support, from an experiential perspective. Such an approach has not been pursued in the IT ethics literature to date. Thus, throughout this account we emphasise the importance of influencing professionals' ways of experiencing their discipline and practice. We suggest that such a change of approach to ethical professional formation impacts three aspects of professional life. Firstly, it promotes thinking about the IT discipline in terms of the end user. Secondly, it argues for an understanding of professional ethics in terms of other people. Finally, it identifies the goal of ethics education as a change in awareness.

This paper uniquely weds these three aspects of IT professional ethics formation. We suggest that it offers a promising framework for influencing IT professionals to adopt ethically mature practice.

In the next section, section 2 *Re-orienting the IT discipline*, we present a model of the field in which IT professionals practice, which maps a change in the focus of IT from being technology-centred to being user-centred. Support for this model is drawn from the IT literature and from the experiences of IT practitioners as evidenced in our empirical studies (Bruce et al. 2004; Stoodley 2009).

The information technology (IT) discipline to date has been principally technology-centred. This influences how IT is understood and frames professionals' expectations of how IT is to be used and developed. We suggest that turning professionals' vision outwards towards the people that technology impacts includes re-orienting IT professionals towards a people-centred rather than an artefact-centred experience of their field. Our position is that, in order to be able to practice in an ethical manner, IT professionals must see vistas beyond technology.

In section 3, *Expanding visions of responsibility*, we add a professional practice aspect to this model which defines ethical practice as being other-centred. This aspect is grounded in a recently completed and ground-breaking empirical study of the experience of IT professionals, which seeks to represent the conceptual world of IT professionals with respect to ethics. The results of that study inform the professional practice aspect of our model. We also find support for an other-centred approach to ethics:

1. in the foundation of Information Ethics, which views ethics from the perspective of the recipient of ethical action rather than the agent (Floridi and Sanders 2002);
2. in the thinking of Emmanuel Levinas, who focussed on relationships of responsibility to others as forming the essence of ethics (Levinas 1998);
3. in the reasoning of Darryl Koehn, who has argued that a relationship based on the professional pledge to serve the public good is the only defensible ground for professional ethics (Koehn 1994); and
4. in the acknowledgement of the Parliament of the World's Religions that humanitarian values are common across a wide spectrum of cultures (Schweiker 2004).

Thus, we understand an ethical perspective is distinguished by an increasingly other-centred attitude. Such notions have not been promoted in depth in the IT ethics literature to date. They are represented here in a new Model of Ethical IT (Figure 3).

In section 4, *Moving professionals towards expanded ethical practice*, we offer a framework for professional development which promotes this viewpoint. This framework is based on the educational Variation Theory which has found that effective learning is facilitated by exposure to variation in experience which the learner would not necessarily otherwise notice. This exposure serves to change the learner’s relationship with the object of learning, in this case professional ethics. We suggest practical ways this approach to learning may be implemented.

We understand our position to be different from much contemporary thinking about IT ethics, through our focus on experience. A focus on experience recognises that professionals see the world through a personal lens. Thus, for example, not only do ethical standards contribute to professional ethics, but also the interpretations put on those standards by professionals. For this reason, an experiential approach to professional ethics is not concerned with the subject (IT professionals) or the object (ethics), but with the relationship between the subject and object (as illustrated in Figure 1). An experiential approach is concerned with how ethics appears to professionals and how ethics reveals itself to them.



Figure 1 The subject-object relationship in IT professional ethics (Stoodley 2009)

A concern with the subject-object relationship leads to an interest in how professionals see, understand, conceptualise ethics – all used here as synonyms for experience. In the light of this, we propose that the most effective means of influencing professionals’ ethical practice rests in influencing their conceptions. “Powerful ways of acting originate from powerful ways of seeing” (Pang and Marton 2003, p.181).

These experientially based approaches to the discipline, professional ethics and education are progressively presented now, culminating in a conceptual model offered for use by educators, industry leaders, academics and individual professionals.

2 Re-orienting the IT discipline

The IT discipline to date has been predominantly experienced as technology-centred. Because of this, the IT artefact often assumes the focal position in IT professionals' conceptualisation of their domain (Burnett and Subramaniam 2004; Ellis and Lowell 1999). This influences how IT is understood and frames professionals' expectations of how IT is to be used and developed. We add our voice to those challenging such a technology-centred view. We further suggest that interventions designed to promote engagement in ethical practice should turn the practitioner's attention outside the technological world, to their clientele and beyond. To turn professionals' vision outwards, their experience of their profession needs radical re-orientation so it is other-centred rather than artefact-centred.

A change in discipline definition is not focussed on in the IT ethics literature to date. Its absence, however, may lead IT professionals to consider ethics as lying outside the scope of IT. We thus suggest that this broadening of IT professionals' conceptualisation of their field is integral to the promotion of IT professional ethics.

In a technology-centred discipline, technology drives the client's agenda, determining how they act in its presence and dominating their plans. "The highest technology artifacts in the world have become our masters, reintroducing us to human slavery more than a century after its abolition" (Dertouzos 2002, p.4). This is because in technology-centred practice the client fades into the background, only vaguely present on the periphery of the practitioner's world. "Our customers are not present in the most crucial place they must be for us as professionals: in our awareness of the impression, the value, and the satisfaction

that our work and actions will produce for them” (Denning and Dunham 2003, p.20).

In order to stimulate a movement towards others, the discipline and the role of professionals within it require re-orientation. A prime place for such a transformation is in the lived experience of those who hold the key to discipline change – the discipline professionals themselves. We propose that IT practitioners with changed conceptions about their discipline and their role will evidence this change in their daily practice, and influence the discipline to change with them.

Hence, we suggest here an alternative approach to thinking about the IT discipline which lays an important foundation for thinking about IT ethics. We have modelled a transformation from IT’s traditional approach to the approach we believe it is evolving towards (Figure 2). This is mapped along two axes which have emerged through the literature and our research as representing significant aspects defining the ethical nature of the discipline. These axes are an artefact developer-to-artefact user axis, and a technology-to-information axis. The following sections present a more detailed description of the ideas represented in the model.

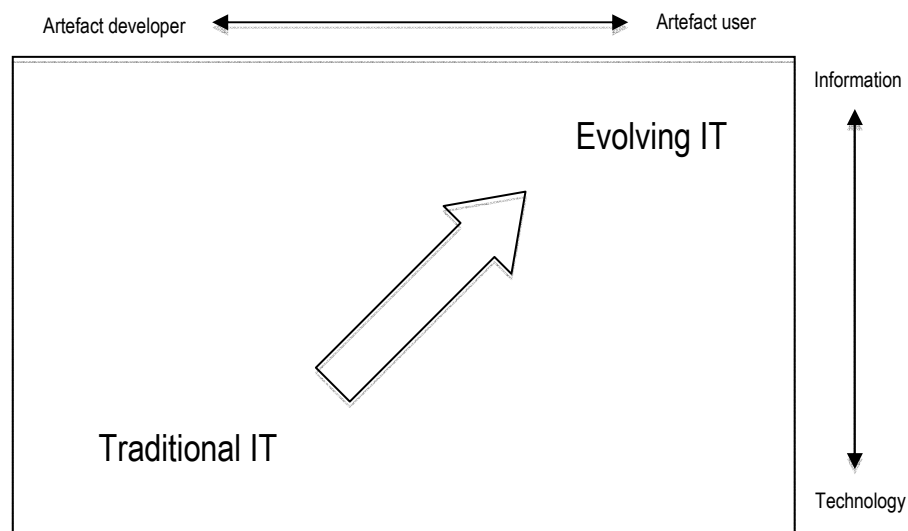


Figure 2 A Model of Evolving IT

2.1 Moving from an artefact-developer focus to an artefact-user focus

The traditional approach to IT (located at the bottom left-hand corner of Figure 2) privileges the technological artefact as constituting the core of IT. Thus, the prominence of technology – its needs, development, demands and possibilities – defines the field and determines our interaction with it. The technology user, in contrast, is expected to adapt their practices and define their roles in response to the demands placed upon them by the artefact.

In contrast, some IT professionals question such a definition of the field and argue for a user focus (located in the top right-hand corner of Figure 2), whereby the user's needs, expectations and plans determine the way technology is developed. In this way, the technology is adapted to the user, who controls how the artefact changes. The artefact's value is thus determined by its ability to meet user needs (Denning 2004; Dertouzos 2002).

2.2 Moving from a technology focus to an information focus

The traditional approach to IT emphasises the centrality of the technological tools (hardware and software) which make up an information system. In this way, goals such as the greater refinement of processing ability and efficient interface of elements of the system assume prominence regardless of whether they meet a human need.

In contrast, some IT professionals doubt the value of technology if the purpose for its development, that is enabling users to meet their information needs, is not considered (Bruce et al. 2004; Finkelstein and Hafner 2002). According to this perspective, the information needs of end users should be focussed on and determine what technology is developed. The information needs of the users assume prominence and meeting those needs becomes the central goal of technological development. Thus, the core business of IT is understood to be the provision of information services, rather than the development of technological tools.

When IT is seen in this broader way, the IT profession enlarges. It moves from the bottom left-hand corner of Figure 2 to the top right-hand corner, encompassing a wider circle of occupations. This movement is already happening, evidenced by the fact that occupations which were once relegated to ‘user’ status are now increasingly involved in activities associated with artefact development. “(S)ome so-called ‘user’ jobs involve systems and web development using powerful desktop tools. This begs the question of where the cut-off line should be drawn on a definition of the IT workforce” (Kaarst-Brown and Guzman 2005, p.4). Many definitions of IT include occupations which focus on information, not just technology, indeed the IT Deans Group of the Computing Research Association of North America have proposed “a new IT discipline with a new research agenda” including the study of information, “how it is acquired, organized, communicated, managed and used by people and organization, and how IT changes those processes, sometimes in fundamental ways” (Finkelstein and Hafner 2002).

We propose that any specific IT activity will lie somewhere along the two continua of artefact developer-artefact user and technology-information, and represents an interaction between them. The IT discipline is already evolving from a technology developer focus to an information user focus, and our understanding is that this trend needs to be encouraged and accelerated in order to progress the field to an expanding vision of ethical responsibility and practice.

3 Expanding visions of responsibility

An understanding of the evolving nature of the IT field towards a user focus begins to turn IT professionals’ attention outwards beyond the boundaries of the discipline as it has been traditionally defined. The traditional techno-centric conception of IT leaves user needs and social factors largely unexplored (Orlikowski and Iacono 2001). “Often, IT professionals focus on the technology rather than how the technology can help IT users perform their work” (Alter 2003, p.381).

If IT professionals' practice is focussed on artefacts, then they may see their responsibility as being quite limited, however if the IT professionals' practice is focussed on people, then their responsibility is considerably expanded. Our understanding is that as IT professionals grow ethically, they will turn their attention increasingly outwards, beyond technology. We argue here that the more outward-looking they become, the more ethical they can claim to be.

3.1 Expanding visions supported by empirical findings

Evidence of such an outward-looking attitude was found in a recent investigation which explored the qualitative differences in IT professionals' experience of ethics (Stoodley 2009). These professionals' attention ranged from themselves and their inner circle of family and friends, through relationships formed in their work, to third parties who they did not know. This signalled experiences of ethics which increasingly incorporated others in the professionals' world. Thus, professionals progressively prioritized others' rights and accepted responsibility for others. The degree to which they focused on others defined professionals' ethical identity. It indicated the extent to which the professionals' own rights and responsibilities were defined in terms of others.

Five qualitatively distinct experiences of ethics were expressed by the interview participants in this project:

1. citizenship of my world;
2. citizenship of the corporate world;
3. citizenship of a shared world;
4. citizenship of the client's world; and
5. citizenship of the wider world.

When experiencing ethics as *citizenship of my world* the IT professional is concentrating on guarding their rights and the rights of those who belong to their inner circle of family and friends. Their intention is to maintain self-preservation. This is a defensive position, with the professional choosing typically to uphold the status quo.

I Yes, whatever decision you take will produce harm in some way or another. Is there a way to see your way through that and figure out what to do?

P I'd like to say I had the answer to that one but... in situations like that I think what I would do is probably do the minimum amount of harm to me! As I said, there's always self-preservation... (Participant 8)

When experiencing ethics as *citizenship of the corporate world* the IT professional is concentrating on upholding the rights of the organisation that employs them. Their intention is to pursue the success of the corporation. This is a dutiful position, with the professional devolving ultimate responsibility to those higher in the organisational hierarchy.

if you identify risks to the organisation or to a process then you have a duty of care... to your managers to... bring it to their attention... (Participant 28)

When experiencing ethics as *citizenship of a shared world* the IT professional is concentrating on upholding both their rights and the rights of their clients. Their intention is to achieve a win-win result. This is a partnering position, with the professional sharing responsibility with the client.

I'd say that's my clearest picture of ethics in IT and again it's more of the win-win. I think we have an obligation to let the customer win and you win. Don't harm yourself but don't harm the customer. (Participant 6)

When experiencing ethics as *citizenship of the client's world* the IT professional is concentrating on upholding the rights of the client. Their intention is to enable client success. This is a representative position, with the professional bearing responsibility for the client's welfare.

... our clients... will have an expectation that we will cover bases that they don't even think of... They may not know how to specify everything, so it's up to us to ... fill in the gaps. So that, if we're building them a system... we try and build it according to what they actually need to do. (Participant 2)

When experiencing ethics as *citizenship of the wider world* the IT professional is concentrating on upholding the rights of humanity in general. Their intention is to uphold personally held convictions about what it means to do the right thing. This is a surrendered position, with the professional serving humanity and accepting any resultant negative consequences to themselves.

The reason I work in education and research is because it's something that I value highly, something that I believe I'm contributing to the well good of man... it's not like making a bank more profitable is a bad thing or an unethical thing to do by any stretch of imagination... But it's about what I want to achieve and what I think that I should be doing to contribute to society and mankind and whatever and I would rather have my skills used in an area which I think is... better... (Participant 13)

All of these citizenship experiences are ethical in and of themselves, however we argue that the more ethically mature an IT professional is, the more of these experiences will be represented in their portfolio. The citizenships are therefore not stages of development, but widening conceptualisations that build on each other. This is supported by the research approach employed to collect and analyse the data, phenomenography, which observes across many phenomenon that the more categories a person is able to simultaneously experience the more comprehensive is their conceptualisation of that phenomenon (Marton and Booth 1997). In this case, it indicates that the more ethically mature the professional is, the more they will look outwards from themselves, seeking to meet others' needs and being willing to accept negative consequences for themselves in the process. This represents an increasingly other-centred attitude.

3.2 Expanding visions supported in the literature

Our claim that the ethical maturity of professionals can be discerned in terms of the extent to which other-centred experiences are represented in their portfolio is further supported in the literature. This is seen in the light of the philosophical orientation of ethics, the ground of ethics in the professions, the demands of ethics in general and an identified common ethic across cultures. Much of this literature has not previously been applied to IT ethics and so offers new insights.

With respect to the philosophical orientation of ethics, we concur with Floridi and Sanders (2002) that it is important to adopt a patient-focussed approach to ethics rather than an agent-focussed approach. In this way, the recipient of ethical action is regarded as the “primary object of the ethical discourse” (p.7), changing the attendant moral perspective and scope of responsibility. This supports a definition of ethics which turns its attention towards others, away from the “individual egocentric self” (Brigham and Introna 2007, p.6). Information Ethics (Floridi and Sanders 2004) argues for the inclusion of all information entities as recipients and raises the question of the moral agency of artificial agents. The implications of this for computer professionals are under discussion (for example, Grodzinsky et al. 2008). In the current investigation of the experiential worlds of IT professionals, artificial agents were not explicitly identified as part of their

awareness. Perhaps the model below (Figure 3) could include artificial agents, both as agents and recipients of moral action, in which case we suggest that other-centredness would remain an appropriate, patient-focussed ethical orientation.

With respect to ethics in the professions, professional ethics has in the past been founded on expertise and contracts, however each of these may, to the contrary, give customers reason to suspect the professional of being unethical. Expertise may be abused, as professionals take decisions based on knowledge the client does not have, offering an opportunity for the professional to exploit their client. Contracts may limit professionals' responsibility towards their client rather than protect the client, offering an opportunity for legitimised neglect. Both expertise and contracts, if they are to provide grounds for clients to expect ethical action on the part of the professional, must be based on a prior condition. That condition is the public promise of the professional to serve their client's good and this alone adequately grounds professional ethics. Thus, promise-keeping to clients is central in professional ethics (Koehn 1994).

With respect to ethics in general, our interaction with others is understood to be the experience which calls forth an ethical response from us. We cannot deny that others exist who are different from us and who cannot be assimilated into our private world. We must respond to these 'others' and it is such response which reveals our ethics. We are therefore all ethical beings, in the sense that to be human is to be confronted with ethics. In this way, our existence is defined by others, each moment of awareness calling forth a response from us towards others. Thus, ethics is central to being human and is defined as responsibility towards others (Davis 1996; Levinas 1998).

With respect to ethics across cultures, religion has been historically understood as a cultural institution which upholds high ethical standards. The Parliament of the World's Religions, in formulating *Towards a global ethic: An initial declaration*, recognised the ubiquity of the Golden Rule: Do to others as you would have them do to you. In 1993 over 200 representatives of more than 40 faith traditions signed this declaration as common ground, which has been confirmed by others since. Thus, ethics is understood as acknowledging the needs and concerns of

other members of a common humanity with whom we share the world. Contrary to popular opinion regarding a perceived relativism of ethical standards across cultures, this humanitarian value appears to be quite stable (Schweiker 2004).

All of the above affirm the importance in ethical conduct of focussing on others. An ethical attitude is a recipient-, client-, other-, humanity- centred attitude. Thus, an ethical professional may be expected to exhibit such other-centredness.

Such an attitude, while perhaps underlying much of the literature on IT ethics, is not explicitly focused on in it. Because of this, this foundational aspect of ethics may have been presumed as common or overlooked. We suggest that only by explicitly drawing attention to other-centredness may a foundation for ethical conduct be adequately established in professionals' practice.

3.3 Modelling expanding visions

Movement towards an increasingly other-centred view of professional practice is reflected in a progressive acceptance of the five citizenships identified in our empirical research. Therefore, we are now in a position to add a professional ethics aspect to our Model of Evolving IT (Figure 2), resulting in a Model of Ethical IT (Figure 3).

The two-dimensional Model of Evolving IT is incorporated in the top left-hand corner of this new model. The other-centred nature of professional ethics is represented along a third dimension, which is an outward-looking axis in the new model (represented by the arrow pointing towards the bottom right-hand corner). Movement outwards along this axis represents a professional whose practice is increasingly defined by their sense of responsibility towards others and their willingness to forego their own interests in order to meet those people's needs.

We include in this new model the information about the citizenships outlined earlier in this article. The citizenship experiences are represented in rectangles whose category names are numbered and placed in their bottom right-hand corners. The professional's relationships with beneficiaries are included in the top

right-hand corners of the rectangles, the acts associated with the experiences are on the right-hand edges and the associated intentions are on the bottom edges of each citizenship rectangle.

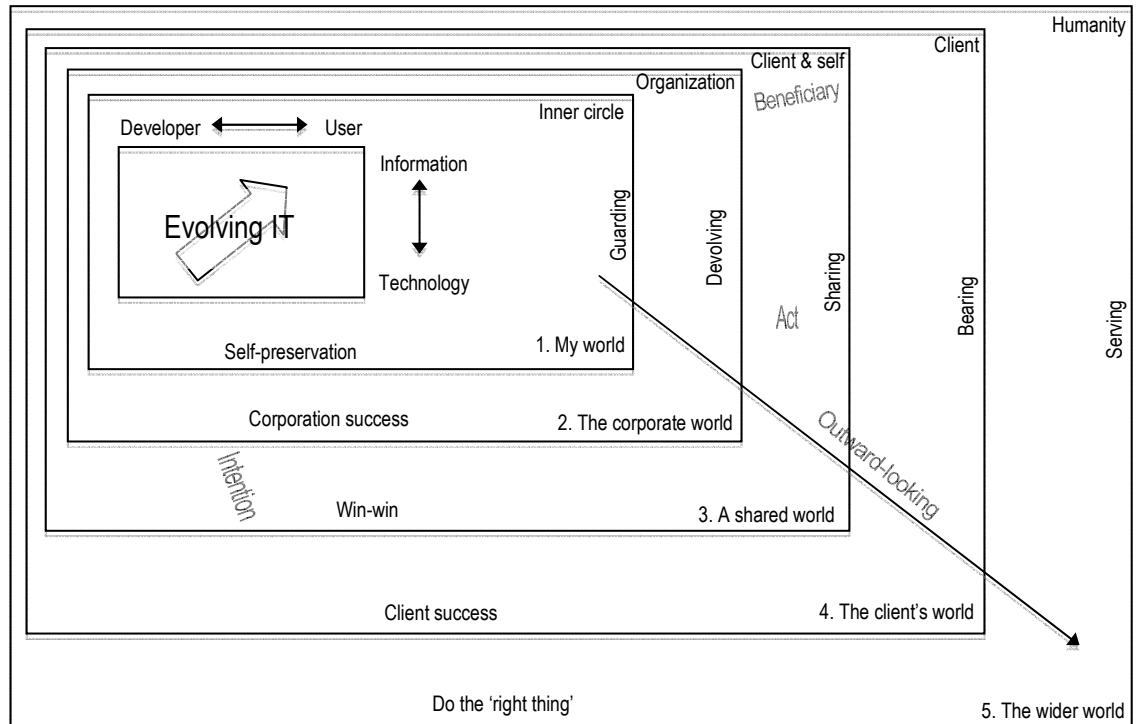


Figure 3 A Model of Ethical IT

This model illustrates more clearly the widening awareness in these experiences. For example, a progression may be seen in professionals' awareness of the beneficiaries across the citizenships (in the top right hand corner of the expanding rectangles), as professionals increasingly include a wider range of people from their inner circle, through the organisation and client, to humanity. This widening awareness is equally evident in the Act and Intention. The model makes the concept of an increasingly outwardly focussed regard conceptually evident to the viewer.

The Model of Ethical IT may thus serve as a powerful conceptual tool. It illustrates the relationships between various key elements in the IT space. It therefore offers a means by which IT professionals may interact with the concepts in an experiential way. Thus, educators may employ the model to stimulate conceptual shifts. Individual professionals may be prompted by the model to

reflect on the applicability of the various citizenships to their everyday practice. Academics may interact with the model when defining the scope of IT professionals' ethical responsibility. Industry leaders may also be inspired by the model when setting standards of conduct and statements of aspiration.

4 Moving professionals towards expanded ethical practice

Given the increasingly other-centred nature of ethics and ethical professional practice adopted in this account, ethical education should aim to stimulate professionals to an expanded experience of other-centredness. This is more than about learning facts or forming justifiable arguments. It is about how professionals see themselves, their discipline and ethics.

An experiential basis for IT professional's ethical development contrasts with prevailing approaches which seem to emphasise either the external imposition of standards or the internal development of decision-making skills. Instead, we are emphasising the relationship constituted between the professional and ethics, as illustrated in Figure 1. To our knowledge, this approach to education has not yet been applied to IT ethical formation and support.

Currently, some approach ethical education as the presentation of standards of conduct. This is primarily in order to exercise control over a professional's behaviour. Codes of ethics are acknowledged as being useful tools for this purpose (Munro and Cohen 2004). However, the use of codes as motivators of ethical conduct have also been questioned on the basis of their inability to cover all possible scenarios, their engenderment of a checklist approach to ethical responsibility, their dependence on ethical awareness to know when they apply, their misuse to legitimise the profession and the difficulty of enforcing them (Bynum and Rogerson 2004; Grodzinsky 2000; Tavani 2004).

Others currently approach ethical education as training in decision-making. This is pursued in order to enable independent thought on the part of the professional. Ethical philosophy and decision-making techniques are often employed to this

end. However, ethics here is typically understood to be a highly rationalistic activity, consistent with Kohlberg's stages of moral development which are intimately linked with cognitive development (Kohlberg 1981). This is criticised as not being representative of how many of us approach ethics (Gilligan 1982), of how an expert typically makes decisions (Dreyfus and Dreyfus 1990) and of effective guidance for ethical conduct (Volkman 2004).

If ethics is essentially the adoption of an other-centred attitude, as argued earlier, we suggest that approaches to ethical education which emphasise ethical standards or ethical decision-making depend on a prior de-centring of the professional. The quality of relationships established through an other-centred understanding of ethics help ensure that ethical standards and decision-making methods will in fact be applied for the good of others. For this reason, a de-centred professional provides an appropriate foundation upon which other influences over ethical practice may build.

Also, as previously discussed, a professional who only understands their discipline in techno-centric ways is unlikely to see their professional practice in user-centred terms. Therefore, a reconceptualization of the discipline towards a user-centred focus is integral to the decentralization of professional practice. It is of note that the Model of Ethical IT extends the Model of Evolving IT beyond the user, to humanity. This includes those influenced by IT but who are not necessarily IT users and even those beyond IT's reach.

Empirical evidence is growing to suggest that a personal re-orientation towards others may be achieved through the application of Variation Theory (Edwards and Bruce 2004; Marton and Pang 2006). This theory understands learning in terms of a change of relationship between the learner and the phenomenon they are learning about. Effective learning develops the learner-phenomenon relationship, making it more comprehensive, more sophisticated, more inclusive of a variety of views. Such learning is enabled by exposing the learner to ways of experiencing the object of their attention which they would otherwise not be aware of.

Research into IT ethics formation has emphasised the importance of attitude and intention (Cronan and Douglas 2006). Therefore, Variation Theory and its association with phenomenography, which offers access to personal experience, presents a useful tool for ethical formation. It is expected that the application of Variation Theory to broaden IT professionals' experience of ethical practice would serve to open up their understanding of what it means to be an ethical IT professional to new vistas, influencing their conception of their professional practice. From this change in conception it is anticipated that professionals' ways of relating to the wider world would change.

Educational interactions which prompt such change through Variation Theory need to emphasise both variation and experience. They do not operate simply on the cognitive or behavioural level. They need to orient the learner towards educationally significant variation that they normally would not notice and lead them to encounter difference at an experiential level.

This variation in experience, however, must be in qualitatively different and educationally significant aspects of the phenomenon. The identification of such critical features of a phenomenon is aided by phenomenography. We suggest that the Model of Ethical IT identifies those critical conceptual changes that are necessary for an IT professional to advance towards a comprehensive awareness of what it means to conduct ethical practice. An expansion of awareness occurs when professionals cross one of the four perceptual boundaries which takes them from one citizenship to another. The model's usefulness for education, then, is to prompt conceptual shifts by exposing professionals to viewpoints they may not have seen before, whereby they are challenged to expand their awareness of who it is they are responsible towards and the impact that has on their own rights.

Activities that could engender such change include (with reference to our Model of Ethical IT):

- clarification of the nature of learning as experiential;
- presentation and discussion of the range of citizenships;
- self-assessment of the learner's practice against the citizenships;
- examination of case studies of IT professionals representing the range of citizenships;

- involvement in practical projects which expose learners to the range of citizenships; and
- journaling of personal engagement with the citizenships.

These activities are suggested ways of drawing the learner's attention to their experience, to alternative experiences and to the differences between these.

We suggest that an emphasis on interaction with a diverse range of people and personal reflection in the light of that interaction are core to this process. Similar approaches to IT ethics education have been advanced by others, for example through the collaborative construction of a code of ethics (Stahl et al. 2004) and through engagement in an industry-academia joint project (Vartiainen 2005). The central goal for us is to intentionally focus on variation of experience. The role of the instructor in Variation Theory is to ensure that the learner's experience is being expanded in ways that are potentially educationally meaningful.

5 Conclusion

Innovations are proposed here, to our understanding of the IT discipline, to our understanding of the nature of professional ethics and to our approach to IT ethics education.

We have argued that for IT professionals to be enabled to become more ethical in their practice:

1. The purpose of IT must be primarily understood to be user-oriented;
2. The nature of professional ethics must be primarily understood to be other-centred; and
3. The goal of ethics education must be understood as primarily promoting a change in experience, towards others.

A systemic approach is necessary, across all of these aspects, in order to exert an adequate influence over the practice of IT professionals. It is not a complete ethical schema, as there is more to be said, for example concerning responding to the demands of competing stakeholders. However, we suggest that the approach offered here is useful in addressing ethical sensitivity and orientation.

This account presents a new, experiential approach to IT professional ethics which we believe offers an important addition to current approaches to professional formation and support. It is in broadening professionals' awareness to more expansive, ethical vistas that they may be inspired to orient their practice, beyond technology, towards the good of the wider world.

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7 References

- Alter, S. (2003). 18 reasons why IT-reliant work systems should replace "The IT artifact" as the core subject matter of the IS field. *Communications of AIS*, 12, 365-394.
- Brigham, M. and Introna, L.D. (2007). Invoking politics and ethics in the design of information technology: Undesigning the design. *Ethics and Information Technology*, 9(1), 1-10.
- Bruce, C., Pham, B. and Stoodley, I. (2004). Constituting the significance and value of research: Views from information technology academics and industry professionals. *Studies in Higher Education*, 29(2), 219-238.
- Burnett, K. and Subramaniam, M.M. (2004). Defining the information technology workforce from the educational perspectives: a pilot study. Paper presented at 5th Conference on Information Technology Education, Salt Lake City, UT, USA.
- Bynum, T.W. and Rogerson, S. (2004). Codes of ethics: Editors' introduction. In T.W. Bynum and S. Rogerson (Ed.), *Computer ethics and professional responsibility* (pp. 135-141). Malden: Blackwell.
- Cronan, T.P. and Douglas, D.E. (2006). Toward a comprehensive ethical behavior model for information technology. *Journal of Organizational and End User Computing*, 18(1), i-xi.
- Davis, C. (1996). *Levinas: An introduction*. Cambridge, UK: Polity Press.
- Denning, P.J. (2004). The field of programmers myth. *Communications of the ACM*, 47(7), 15-20.
- Denning, P.J. and Dunham, R. (2003). The missing customer. *Communications of the ACM*, 46(3), 19-23.
- Dertouzos, M. (2002). *The unfinished revolution: Human-centred computers and what they can do for us*. New York: HarperCollins.
- Dreyfus, H. and Dreyfus, S. (1990). What is morality? A phenomenological account of ethical experience. In D. Rasmussen (Ed.), *Universalism vs. Communitarianism: contemporary debates in ethics* (pp. 237-264). Cambridge, Ma.: MIT Press.
- Edwards, S.L. and Bruce, C. (2004). The assignment that triggered change: Assessment and the relational learning model for generic capabilities. *Assessment & Evaluation in Higher Education*, 29(2), 141-157.
- Ellis, R. and Lowell, B.L. (1999). Core occupations of the U.S. information technology workforce. <http://206.67.48.105/IT-1.pdf> Accessed May 1, 2009.
- Finkelstein, L. and Hafner, C. (2002). The evolving discipline(s) of IT (and their relation to computer science): A framework for discussion. <http://www.cra.org/Activities/itdeans/finkelstein.pdf> Accessed May 1, 2009.
- Floridi, L. and Sanders, J.W. (2002). Mapping the foundationalist debate in computer ethics. *Ethics and Information Technology*, 4(1), 1-9.
- Floridi, L. and Sanders, J.W. (2004). On the morality of artificial agents. *Minds and Machines*, 14(3), 349-379.

- Gilligan, C. (1982). *In a different voice: Psychological theory and women's development*. Cambridge: Harvard University Press.
- Grodzinsky, F.S. (2000). The development of the 'ethical' ICT professional: and the vision of an ethical on-line society: How far have we come and where are we going? *Computers and Society*, 30(1), 3-7.
- Grodzinsky, F.S., Miller, K.W. and Wolf, M.J. (2008). The ethics of designing artificial agents. *Ethics and Information Technology*, 10(2-3), 115-121.
- Kaarst-Brown, M.L. and Guzman, I.R. (2005). The IT professional: Who is "the IT workforce"?: challenges facing policy makers, educators, management, and research. Paper presented at ACM SIGMIS Conference on Computer Personnel Research, Atlanta, Georgia, USA.
- Koehn, D. (1994). *The ground of professional ethics*. London: Routledge.
- Kohlberg, L. (1981). *Essays on moral development, Volume 1: The philosophy of moral development*. San Francisco: Harper & Row.
- Levinas, E. (1998). *Entre nous: On thinking-of-the-other*. London: Athlone Press.
- Marton, F. and Booth, S. (1997). *Learning and awareness*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Marton, F. and Pang, M.F. (2006). On some necessary conditions of learning. *The Journal of the Learning Sciences*, 15(2), 193-220.
- Munro, K.I. and Cohen, J.F. (2004). Ethical behaviour and information systems codes: The effects of code communication, awareness, understanding, and enforcement. Paper presented at 25th International Conference on Information Systems, University of Virginia, Charlottesville, Virginia, USA.
- Orlikowski, W.J. and Iacono, C.S. (2001). Research commentary: Desperately seeking "IT" in IT research - a call to theorizing the IT artifact. *Information Systems Research*, 12(2), 121-134.
- Pang, M.F. and Marton, F. (2003). Beyond "lesson study": Comparing two ways of facilitating the grasp of some economic concepts. *Instructional Science*, 31, 175-194.
- Schweiker, W. (2004). *The Blackwell companion to religious ethics*. Oxford: Blackwell.
- Stahl, B.C., Wood, C. and Howley, R. (2004). Teaching professional issues in computing through the development of a student code of conduct. *Ethicomp* 2(1).
<http://www.ccsr.cse.dmu.ac.uk/journal/home.html> Accessed May 1, 2009.
- Stoodley, I. (2009). IT professionals' experience of ethics and its implications for IT education. Doctor of Philosophy Thesis. Queensland University of Technology, Brisbane, Australia.
- Tavani, H.T. (2004). *Ethics and technology: Ethical issues in an age of information and communication technology*. Hoboken: John Wiley & Sons.
- Vartiainen, T. (2005). Moral conflicts in a project course in information systems education. Doctor of Philosophy Thesis. University of Jyväskylä, Department of Computer Science and Information Systems, Jyväskylä, Finland.
- Volkman, R. (2004). Being a good computer professional: The advantages of virtue ethics in computing. *Ethicomp* 2(1). <http://www.ccsr.cse.dmu.ac.uk/journal/> Accessed May 1, 2009.