

Chapter XIV

Ethical Issues and Pervasive Computing

Penny Duquenoy

Middlesex University, London, UK

Oliver K. Burmeister

Charles Sturt University, Wagga Wagga, Australia

ABSTRACT

There is a growing concern both publicly and professionally surrounding the implementation of Information and Communication Technologies (ICT) and their social and ethical impact. As these technologies become increasingly pervasive and less visible to the user, there is a greater need for professionals to address the concerns in order to regain public trust and maximise the benefits that these technologies can bring. This chapter explores the ethical aspects of the world of pervasive computing and shows the need for an ethical perspective when considering the design and implementation of complex, integrated, multiple systems. We present the background to ethics and technology to give the foundation for our discussion, and refer to current research and ethical principles to provide the argument for ethical consideration. Finally, codes of professional conduct provide the standards, and endorsement, for professional responsibility.

INTRODUCTION

It has become increasingly clear that Information and Communication Technologies (ICT) raise

ethical issues. The volume of research presented at conferences dedicated to computer ethics¹, the numerous academic texts on computer ethics produced to aid in the education of computer science

undergraduates, and the formation of ethics groups within professional bodies² (internationally and nationally) give an indication of the amount of concern within the profession on this subject. In the research context the European Commission has several projects from the 6th Framework tackling these issues³ and has increased the visibility of ethics and ICT in its 7th Framework Programme.

With the emergence of these technologies over the last 10 years or so their ethical impact has often only become evident following implementation, for example many people now have concerns regarding privacy as a result of massive data collection, and extended monitoring capabilities. However, as ICT increasingly pervades almost every aspect of daily life (hence the term ‘pervasive computing’) supporting not only industry but also the citizen population, the aspects of ethical impact have had a significant effect on public perception and uptake. As we have just noted, public discussions have largely centred on the issue of privacy in terms of individual private space, and personal data. As a consequence we have seen a greater emphasis on addressing this issue resulting in substantial developments to offer protection through security technologies and efforts to encourage public trust by involving the users in the management of their privacy (for example, privacy policies and customisation of their Internet settings).

It is recognised that public confidence is key to the successful implementation of new technologies in the public sphere, not least by professional bodies who have demonstrated their commitment for public welfare in their codes of ethics for some years⁴. More recently, we have seen increased attention to the incorporation of ethical considerations in technical development by research funding agencies and the United Nations⁵. Quite apart from the strategic benefits of public acceptance in respect of continued economic growth, professionals have an ethical imperative to consider the benefits and harms to society and individuals within society when planning the next technological development.

Pervasive computing is not so much a new technological development (as, for example, the mobile phone) but a term that describes the concept of computer technologies becoming embedded within the social infrastructure in such a way that their use becomes commonplace and often invisible – the use of computer technology in cars is a good example. Other terms that are used to describe this concept are ‘ubiquitous computing’ and ‘ambient intelligence’. A recently published book resulting from one European Project that was charged with looking at forthcoming security issues announces (Wright et. al., 2008): “In the near future, every manufactured product – our clothes, money, appliances, the paint on our walls, the carpets on our floors, our cars – will be embedded with intelligence, networks of tiny sensors and actuators, which some have termed “smart dust” or an “Internet of Things”. The world of ambient intelligence (AmI) is not far off. We already have surveillance systems, biometrics, personal communicators, machine learning and more. Ambient intelligence will provide personalised services – and know more about us – on a scale dwarfing anything hitherto available.”

As we move forward to utilise this technology to support our lifestyles in a variety of different ways that include communication and information exchange between devices and between humans and the devices, it is important that designers, developers and most importantly those funding development are confident that their products will be accepted in the marketplace – that is, that the public is ready to ‘adopt’. The testing and evaluation that has historically taken place in the development process for individual devices does not go far enough to ensure public acceptance of the convergence of many technologies and devices that enable interactions beyond the simple functionality and usability testing within a lab. Thus, one cannot engage in extensive studies of users. Instead, following the concept of the heuristic evaluation used in the field of Human Computer Interaction (HCI), expert evaluation of proposed

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