Chapter 2

Anticipating Human Enhancement: Identifying Ethical Issues of Bodyware

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ABSTRACT

This chapter provides a novel approach for identifying ethical issues on bodyware as new ICT devices are being integrated into human bodies with the help of unconventional interfaces. To establish a primer to the range of potential questions to this phenomenon, the authors provide an ethical analysis taking an agential realist perspective (Barad, 2007) and using anticipatory technology ethics (Brey, 2012). They illustrate their approach with the Student Locator Pilot Project in San Antonio Texas as a case study, where “smart” ID cards with embedded RFID chips have been deployed. To conclude, the authors argue that their approach is well suited to address questions on how augmented bodies and enhanced minds of human beings intra-act with bodyware in everyday social and organizational life.

INTRODUCTION

Human enhancement is generally defined as any “modification aimed at improving individual human performance and brought about by science-based or technology-based interventions in the human body” (STOA, 2010, p. 6). Advancements in nanotechnology, biotechnology, information technology and cognitive sciences (NBIC), combined with the achievements in materials science, have created new capabilities for human enhancement. Convergence of these technological domains and scientific disciplines has resulted in a technology category called Human Enhancement Technologies (HET) (Bainbridge & Roco, 2002, 2005). While NBIC convergence continues, the convergence of Information and Communication Technologies (ICT) and biotechnology has created an important category in HETs. We call this type of HET ‘bodyware’, where novel ICT devices are being integrated into human bodies with the help of new and unconventional interfaces (Tunçalp & Fagan, 2013). For example, electronic pacemakers, implanted drug pump systems and
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electroencephalographically (EEG) directed exoskeletons could all be considered as different examples of bodyware.

The capabilities and consequences of HET have been under heavy public, political and scholar scrutiny. Besides individual and social level changes, bodyware has a large potential to remarkably change the nature of work and the workplace. Altering the definition and the construction of body and self in the workplace has the potential to significantly influence the nature of human organizations and the process of organizing. Our theoretical tools and approaches need further development in order to better understand and explain what risks and consequences emerge when the human body integrates with bodyware.

The traditional understanding of ICT considers technology as something we merely use like a tool. However, bodyware challenges this notion by viewing technology as something we merge and simply ‘become’. Bodyware also has the potential to significantly alter the way we perceive organizations. How might bodyware be deployed in organizations? How might bodyware bridge or suspend time and space, enabling new forms and environments of collaboration between people? How does implanting technology on and into human bodies change the way we understand technology implementation projects and their potential failure? How do such technologies change the nature and the delivery of public service and the relationship between a citizen and the state in general? How might bodyware alter our discourses about self and others and influence our culture with the performativity of bodyware in daily practices? In all possible scenarios, how should we consider different types of bodyware without essentially attributing decisive powers to technologies themselves or to the humans using them (technological or social determinism) (McLoughlin & Dawson, 2003).

While diverse questions might be asked about bodyware, underlying ethical issues relate many of these problems together. To establish a primer to such questions in this chapter, we aim to provide an ethical analysis of bodyware. This chapter is structured as follows. In the next section, we define bodyware, types of bodyware artifacts and potential applications. Then we introduce extant approaches that analyze and anticipate potential ethical issues in bodyware. Next we present our integrative approach to anticipate the impact of bodyware on the mind, body and capabilities of humans. In the last sections, we discuss our possible future research directions and our conclusions.

BACKGROUND

Defining Bodyware

Bodyware is a result of ICT and biotechnology convergence, and builds upon advances in cognitive science, nanotechnology and new materials (See Figure 1). The emergence of bodyware technology has led to a number of novel devices. Cognitive science and biomedical engineering have been integrating these artifacts into human bodies. New interfaces that read bodily movements, human emotions and brain waves are becoming increasingly commonplace, creating unconventional experiences and entirely new applications.

Bodyware devices can be located inside the human body or on the body surface, temporarily or permanently. They are beyond “smart” prostheses because their primary objective is not replacing a missing body part but rather enhancing existing capabilities or contributing new competences with their functionalities. Thus, bodyware devices are recreating embodying individuals as ‘cyborgs’. These devices are extremely personalized for embodying individuals and ultimately adaptive to physiological responses. These devices are sometimes aware of their bodily context and may even anticipate individual intentions with bodily mediation to different degrees.

For analytical purposes, we define four types of bodyware according to level of smartness and self-containment: simple apparatus, smart apparatus, implanted devices and augmented devices. As we