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## Ethical dilemma scenarios and emerging technologies

David Wright<sup>a,\*</sup>, Rachel Finn<sup>a</sup>, Raphael Gellert<sup>b</sup>, Serge Gutwirth<sup>b</sup>, Philip Schütz<sup>c</sup>, Michael Friedewald<sup>c</sup>, Silvia Venier<sup>d</sup>, Emilio Mordini<sup>d</sup><sup>a</sup> Trilateral Research & Consulting, Crown House, 72 Hammersmith Road, London, W14 8TH, UK<sup>b</sup> Vrije Universiteit Brussel, Pleinlaan 2, 1050 Elsene, Belgium<sup>c</sup> Fraunhofer Institute for Systems and Innovation Research, Breslauer Straße 48, 76139 Karlsruhe, Germany<sup>d</sup> Centre for Science, Society and Citizenship, Via Capo di Ferro, 23, 00186 Rome, Italy

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## ABSTRACT

This paper posits that ethical dilemma scenarios are a useful instrument to provoke policy-makers and other stakeholders, to including industry, in considering the privacy, ethical, social and other implications of new and emerging technologies. It describes a methodology for constructing and deconstructing such scenarios and provides four such scenarios in an orthogonal relationship with each other. The paper describes some different, but closely related scenario construction–deconstruction methodologies, which formed the basis for the methodology adopted in the European Commission-funded PRESCIENT project. The paper makes the point that in ethical dilemma scenarios, it is not immediately apparent what choices policy-makers should select. Hence, there is a need for undertaking a privacy and ethical impact assessment and engaging stakeholders in the process to identify and discuss the issues raised in the scenarios.

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## 1. Introduction

Emerging technologies often raise privacy, ethical, societal and other issues. Project managers and stakeholders can address such issues using different instruments, especially by means of different types of impact assessments, such as privacy, ethical, social, technology and/or surveillance impact assessments. Another useful instrument is a scenario, especially a scenario that provokes project managers, policy-makers and stakeholders into thinking about the issues raised by the emerging technology and how they might deal with those issues. We subscribe to the dictum of scenario guru Peter Schwartz who defines scenarios as “a tool for ordering one’s perceptions about alternative future environments in which one’s decisions might be played out... Concretely, they resemble a set of stories.” He emphasised that “scenarios can help people make better decisions –

usually difficult decisions – they would otherwise miss or deny.”<sup>1</sup>

This paper describes the process of creating ethical dilemma scenarios involving new and emerging technologies. It is based on the premise that the development and deployment of new and emerging technologies often give rise to privacy issues and ethical dilemmas. By ethical dilemmas, we mean situations involving ethical principles and issues where the choice of what might be the right decision, the right course of action, is not immediately clear and hence requires a privacy and ethical impact assessment in which stakeholders are engaged in order to help policy-makers and/or industry project managers to arrive at an optimal choice.

One of the aims of the PRESCIENT project,<sup>2</sup> funded by the European Commission, was to provide an early identification of privacy and ethical issues arising from new and emerging technologies and their relevance for EC policy, to illustrate these issues in scenarios and to develop a privacy and ethical

\* Corresponding author. Tel.: +44 207559 3550.

E-mail address: david.wright@trilateralresearch.com (D. Wright).

<sup>1</sup> Both quotes come from Schwartz [1: 4].<sup>2</sup> www.prescientproject.eu.

impact assessment methodology which could be used to resolve the ethical dilemmas raised in the scenarios.

Following an analysis of privacy and data protection as conceptualised from an ethical, socio-economic and legal perspective, the PRESCIENT partners<sup>3</sup> prepared a set of case studies wherein they identified the privacy, data protection and ethical issues arising from several different new and emerging technologies and their applications. The technologies and applications included RFID-embedded travel cards and passports, unmanned aerial systems (“drones”), body scanners, biometrics, DNA sequencing and human enhancement.

Building on the findings from the case studies, the partners developed scenarios highlighting the privacy and ethical issues that might arise with such technologies and, in particular, the ethical dilemmas. The consortium then went on to develop a privacy and ethical impact assessment framework by means of which such privacy and ethical issues could be addressed.

Furthermore, the development of “what if” scenarios, like those set out in the pages that follow, could inform or be factored into a privacy and ethical impact assessment as a way of stimulating stakeholder interest in the process and consideration of possible risks.

## 2. Theoretical background

The theoretical background for this paper draws on three strands. The first provides an overview of scenario analysis; the second provides some context in terms of ethical theory and philosophy relevant for this paper; and the third relates these two strands to ethical impact assessment which frames the conclusion of this paper, “The way forward”.

### 2.1. Scenarios

There are many different types of scenarios and methodologies for constructing and deconstructing them.

Scenarios are frequently-used tools for looking at the future. However, they are not predictions. Rather, they describe plausible and/or desirable futures and possible ways on how to realise these futures [2,3]. Scenarios may generally be normative or exploratory. They may be “sunny” or “dark”, the first describing a positive future, one that we want, while the second describes a future that we do not want [4,5].

Some scenarios may be narratives, i.e., they tell a story, while other scenarios may be descriptive, and describe a future. Scenarios sometimes are structured as sensitivity analyses, coming as a set of three, with one scenario describing the “status quo”, i.e., a future with no surprises, a worst case scenario and a best case scenario.

Herman Kahn, the father of scenario construction for futures research and policy analysis, tended to think in terms of three alternative scenarios applied to any subject: (1) surprise-free or business-as-usual that simply extrapolates current trends with interplay of the trends; (2) worst case scenario based

on mismanagement and bad luck; and (3) best case scenario based on good management and good luck [6].

Scenarios can also be structured orthogonally along two important dimensions, with a set of four scenarios, each occupying a different space in a quadrant where, for example, the horizontal axis is the degree of impact and the vertical axis is the degree of uncertainty. Typically, scenarios on such a grid are constructed from the variation in two key drivers. Our scenarios have “tweaked” this traditional approach, as described in more detail below.

Point of view is a factor to be considered too. Some scenarios could be set out as forecasts, i.e., from the perspective of someone today gazing into the future and offering his or her prediction of what might unfold. Or they could be told from the point of view of a witness in, say, 10 years from now, by someone who is like a reporter, engaged in reportage, describing the future as a lived event.

Scenarios can be short vignettes of a paragraph or two, or relatively long and detailed of many pages – or even book length (e.g., Huxley's *Brave New World* or Orwell's *1984*). They can be conveyed on film (Spielberg's *Minority Report*) as well as on paper. Jerome C. Glenn and The Futures Group International provide a very good overview of the different types of scenario construction in their chapter on “Scenarios” for the Millennium Project [7].

Technology scenarios can serve many different purposes. They may be used as warnings for policy-makers and industry decision-makers of the risks that may arise with the development of new technologies [8]. They may be developed to describe the kind of future that we want and to prompt us to consider what steps we need to take to arrive at that future (backcasting or roadmapping). They may be “what if” scenarios, i.e., what would we do if a future as described by the scenario arrives. They may serve as a way of engaging stakeholders to think about the future. Those developing scenarios should be clear about how they intend to use the scenarios, and what they want the scenarios to achieve.

The authors wanted to develop scenarios that highlighted ethical dilemmas which do not present easy policy choices (each alternative is equally problematic) for which there is a need for privacy and ethical impact assessments. Thus, we would describe our scenarios as “what if” scenarios – in other words, if policy-makers and/or other stakeholders were to face a future such as that described in the scenario, how would they respond? What would they do to address the privacy and ethical issues raised in the scenario?

### 2.2. Ethics and emerging technologies

Ethical reflection has an increasingly crucial role with respect to the challenges raised by technological innovation and by the very concept of reflective science. Ethics can function as a moderator and mediator in the necessary dialogue between science and society. In the multi-cultural realm in which we find ourselves, ethics can also be regarded as a legitimisation process for the pluralism of conceptions of “good lives”. Ethics can inform debates. Ethics could become an element in processes of socio-technically distributed innovation, in which products and services are developed or at least refined at societal level [9].

We defined ethics as a philosophical enquiry in concepts involved in practical reasoning, i.e., concepts related to the

<sup>3</sup> The PRESCIENT partners comprised Fraunhofer Information Systems Institute (Germany), Trilateral Research & Consulting (UK), Vrije Universiteit Brussel (VUB, Belgium) and the Centre for Science, Society and Citizenship (CSSC, Italy). The 3-year project concluded at the end of December 2012.

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