Information Technology Ethics

Information Technology Ethics:

Concepts and Practices in the Digital World

Edited by

Hajer Kefi

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PREFACE

TREVOR MOORES

According to the renowned physicist Stephen Hawking, if full artificial intelligence (AI) existed today we would be quickly superseded by their superior rate of evolution (Cellan-Jones, 2014). By "full AI" Hawking means the type of perceptive, emotional machine characterized by Hal in "2001: A Space Odyssey," or the cyborgs in The Terminator movies. These machines learn, plan, and are determined to do what they need to do: Just like us. Given the speed at which these computational beings could evolve, however, it would just be a matter of time before they would create their own destinies, and we would become just another life form on the planet. We could program them to have a fail-safe in which our safety and happiness are their prime objectives, but if they were truly intelligent, they could decide that particular rule was against their own interests.

We are far from such human-like machines. Surely advances in smart technology will eliminate the drudgery of everyday life and allow us more leisure time to explore the spiritual meaning of life. Whilst we may be plundering the earth's resources and possibly damaging the environment in which we live, we are also learning how to be efficient with those resources. We are developing alternative energies, better healthcare, and enjoying a considerably higher standard of living. If we have accomplished so much over the last 100 years, the future must promise even greater advances. And, really, how bad could it be? Well, let me paint a picture with a short story, and while you read it, think to yourself what is good or bad about the events described. Imagine for a moment that we are 100 years in the future:

The alarm next to your bed starts to beep and quickly drops it's decibels as you stir and slide out of bed. You pad across the bedroom, the climate control having learned your preferences you barely feel the air: It is neither hot nor cold; it's perfect. The light comes on as you enter the bathroom, and you stare into the mirror. The mirror stares back, detecting the level of serotonin with a scan of your eyes. The brightness of the lights are adjusted, the news headlines appear on the integrated TV, and the

chemical mix of your toothpaste is adjusted to take account of the slight puffiness in your face. A quiet tap-tap follows your motions as you brush your teeth, one tap for each circular motion. It must be circular otherwise the tap turns to a "blah!" and you have to brush that tooth again, because the mirror says so. But you are already darting through the list of emails and text messages that you received while you were asleep. The "ting!" says you have finished brushing and you can go into the shower. The water is perfect: Neither hot nor cold. You just need to stand there, arms raised, and the jets sweep across your body, foaming, rinsing, drying, and then you're done. An email is sent to your doctor, noting a small discoloration in the freckle on your left leg. Probably nothing to worry about.

Back to the mirror, the headlines talk about the weather, your itinerary for the day. It's almost as if the whole revolves around you. Three sets of clothes appear on metal hangers. They are all dark. You wish you could wear the light blue suit, just for fun, but as if reading your thoughts the mirror reminds you that you have a meeting with the boss today. Must look your best. You'd forgotten about that. Good job your calendar is working. You dress, and that gentle voice speaks again, inviting you to breakfast. Into the kitchen you go. Laid out in pristine order is the pancakes and fruit you knew you wanted that morning. The coffee is hot and perfectly brewed. Always perfect. But you are already scanning the infotainment unit for more messages. So many ads.

You wonder if you might have missed messages from your friends. You're meeting the boss today, they must know that. You share your calendar with all your friends. They should know how important today is. But you like the video of a duck wearing a tuxedo. It's funny. You check another one about a cat wearing a cowboy outfit, then one of a child falling off a pony, then one of a horse kicking a goat, and as the "ting!" of the clock gets louder you realize half-an-hour has passed and you haven't even finished your breakfast. If you don't finish your breakfast the baking system might think you don't like pancakes anymore, so you wolf down the cold remnants and coffee. The "ting!" turns to a "blah! blah!" as the clock strikes 8. Time to go.

The side door automatically unlocks as you turn the handle and enter the garage. The car disengages from the charging station and is lit up ready to go. The door slides open and you ease into the main seat. The destination "Office" is already displayed on the control. You press the "Go" button and after you have snapped the safety belt across your waist the garage door lifts up and the car quietly glides into the street. But you're not watching. There was another video about another animal doing something funny that you wanted to watch. You can't find it, so you switch to your video game. One or two more victories and you'll be a level 43 master! Not that you care too much about the game. Anything to pass the

time as the car directs itself on your way to work. Travelling to work is so boring. But soon enough, the car begins to "ting! ting!" as you approach the main door of the office. Out you hop. The car door closes and it glides away to the parking spaces. You are not even sure where the car parks itself. Maybe it wears a cowboy outfit, pushes children off ponies, and kicks goats. You're not sure why you thought of that, but you chuckle as you enter the building.

You see the first person of the day: Angela. She works on 6, or is it 8? You've seen her before. Checking your tablet you see that you are Facebook friends. You sent her a "like" last week. She must know you. But anyway, you travel up the elevator in silence. You think you should say something, but before you can speak she gets off on the 7th floor. She got off the wrong floor! Does she hate you so much that she would get off the wrong floor rather than speak to you? You didn't even say anything to her. Why would she be so upset? You check your tablet. More messages. A-hah! Someone did remember that you are meeting the boss today and has sent you a "thumbs up" emoticon. Then a few more flood in. Probably just your calendar requesting emoticons. You make a mental note to turn that option off when you get back. If real people can't be bothered to message you, why bother? You post a message about Angela on Facebook. She's not a nice person, after all.

You reach your desk at the usual time. The computer is on. There are a few post-its bobbing up and down on the right-hand screen, demanding your attention first. You already feel bored. It was a long drive in. You failed to level up on your video game. Angela annoyed you. You have to see your boss later. So much to do. You click on the screen and your calendar reminds you of a few things that you need to do, but you are already opening the video tab and searching for more cats, ponies, or anything funny. There is a video with a screen grab you recognize. Is that Angela? Is she really throwing that chair across the room? Did the leg of chair really stick into the wall? Wow! Now she's in her own viral video! Something about going ballistic over a Facebook insult. You always knew Angela was a bit crazy. You are still chuckling when a voice message comes through. It's the boss.

So up the elevator you go. You reach the right floor without even having to think about it. Your calendar knows where you were going. You check your reflection in the tablet "mirror" and make sure you are clean and tidy. The tablet says you look good. Even so, you are nervous. This will be the second person you've seen today. That's two more than usual! You tap your arrival into the secretarial kiosk and a notice appears. The face of your boss appears, or at least you think it is. You've never met. "Your position has been terminated," says the image. Staring blankly, you click on the "appeal" button without even thinking. "You have violated the

provisions of the company's rules of ethics, (1) misuse of computer resources." retorts the image. You click on the "Legal appeal" button. In the box you write: "I have worked here for 10 years." You can't think of anything else to say, but surely your loyal service is worth something. You click "submit" but within a few seconds the message "Appeal denied" lights up the screen. A copy of your Facebook post is shown next to the video of Angela throwing the chair. Oh, she was angry about your post. You didn't think she would react like that. Then you remember, you've never actually spoken. Your tablet "tings!" and a message appears noting the legal fees being deducted from your account. You wonder if your calendar picked the right lawyer.

Your desk is dark when you return with a clock ticking down the seconds before you are required to leave the building. Propping up your tablet you see messages telling you to cheer up. There are more jobs out there. Indeed, your career folder is filling up. Job interviews, outright job offers, it's all so easy. With the decline in the human population the demand for workers outstrips the supply. It won't be long before you get another job, but, you sigh, it'll probably be as boring as this one. For once, you wished everyone didn't know anything and everything you do.

So if this is our future, is it good or bad? There are clearly many things to hope for in this story: A house that is so connected and in tune with its occupant that climate-control, water temperature, even breakfast, are perfectly matched. Technology helps us stay healthy, drive safe, organize our day, and facilitate our daily tasks. No cyborgs running amok here. We are released from the chores of today's life. And then what? How many of us are geared up to be the spiritually enlightened souls that a perfectly technological world is meant to give us? Rather than reaching a higher plane, we could just as easily sink into a life devoid of the struggles that our evolution has prepared us for. What meaning do we attach to our activity? Who are we if we are not inventors that struggle to obviate the dangers of our existence and propel ourselves to a better world? And if we don't need to struggle, what then?

Perhaps the most dangerous aspect of our protagonist's life is the lack of human interaction. We are social beings, but social beings capable of the most vicious attacks on our neighbors. While Twitter has been cited as a key support for organizers of the Arab Spring in 2013 (Wolman, 2013), social media has also been used by terrorist groups to disseminate their propaganda (Cowell & Scott, 2014). The effectiveness of these technologies due to the extent to which they are integrated into our lives. For some, one's online life has become so important that defriending on Facebook can lead to murder (Flacy 2012), fatal accidents have been

attributed to messaging while driving (Matyszczyk, 2015), and being online means being found and hounded wherever you go, even to the point of suicide (Dean 2012). Having friends is an essential part of being social, but the total count shouldn't be more important than actually interacting with one another: Being together should be more important than being online; Hugging should be more important than "liking."

Of course, these dark images do not need to our future. But Hawking and others ask us to be aware of the potential pitfalls of our glorious advance in technology. Science fiction writers such as Jules Verne, Aldous Huxley, and Arthur C. Clarke have painted pictures of what the future could hold, while Hollywood has made its own contribution with movies such as Star Wars, Blade Runner, Terminator, The Matrix, and Avatar. At the end of the book or the movie, we are asked to ponder the question: What do we want technology to do *for us*, and what, in return, will technology do *to us*? This question is at the heart of our discussion over the benefits of developing technology that can transform the way we work, but which can also redefine our relationship to each other.

ACKNOWLEDGEMENTS

INTRODUCTION

HAJER KEFI

"Through our scientific and technological genius we've made of this world a neighborhood. And now through our moral and ethical commitment we must make of it a brotherhood. We must all learn to live together as brothers—or we will all perish together as fools." (Martin Luther King Jr.)

Information is everywhere. An unprecedented advance in digital technology in the last fifty years has made this possible. Information is a chance to make sense of the world around us. It is also a danger: it reveals our fragility and weaknesses. This is why we need frontiers, boundaries and filters to establish an order, a moral and ethical framework in which we can live together, create, preserve or express our differences. Ethics is at stake here, and more precisely what we call information technology ethics: a relatively new academic field which is still in search of its identity (Tavani, 2002).

Ethics related to what exactly? Information Technology (IT) or Information Systems (IS)? For many people these two labels are almost synonymous because 'systems' seem to be presumed to be 'computer systems'. This is certainly not true. A clear difference has been made between these terms since the sociotechnical research field (Bostrom and Heinen, 1977) defined information systems as purposeful devices aimed to process, store and communicate information in and between organizational settings using, as an infrastructural support, information technology, also called Information and communications technology (ICT). As such, IT can be considered as a subset (a subsystem) of IS, or more precisely IT based IS (IS/IT) defined as a combination of machines and people, virtual and social networks, material and social processes.

From another perspective, IS seem to be regarded as organizational resources serving business purposes, while IT deals globally with computing and internet based applications at use in and outside organizations, for private and professional aims. Management Information Systems (MIS) has therefore become a specific academic curriculum

within business studies dealing with the financial, marketing, human resources and organizational aspects of IS, and also a research stream.

Our focus in this book will be on the ethical issues related to IS/IT development and use, which we will refer to as IT ethics. Neighboring denominations exist of course. The most popular are 'Computer ethics' and 'digital ethics'. Used interchangeably, they are defined as the branch of applied ethics which analyses the impacts of IS/IT on the rules of conduct in society (Bynum, 2011).

Norbert Wiener is recognized as the founder of this field in the 1940s. Besides his seminal work on cybernetics, Wiener considers that the "great principles of justice" of one's society could serve as the analytical canvas upon which IS/IT ethical issues have to be addressed (Wiener, 1950). During the 1980s, Maner clearly related IS/IT ethics, i.e. "ethical problems aggravated, transformed or created by computer technology" to philosophy and put forward the utilitarian and deontological underpinnings of this field.

Another significant turning point was Moor's article "What is Computer Ethics?" (1985), in which he argues that computer technology is revolutionary because it is logically malleable:

> "Computers are logically malleable in that they can be shaped and modeled to do any activity that can be characterized in terms of inputs, outputs and connecting logical operations [. . .] Because logic applies everywhere, the potential applications of computer technology appear limitless" (Moor, 1985, p.266).

At the same time, Mason (1986) made a valuable contribution by defining four ethical concerns; privacy, integrity, intellectual property and accessibility. Since that time, an extensive number of issues have emerged including private data protection (Sviokla and Gentile, 1990), IS/IT misuse (Dorf, 1999, Desai et al., 2008) and cybercriminality ((Baltzan and Phillips, 2008). Gotterbarn's (1991) approach of IS/IT ethics is not focused on usage but advocates for a deeper attention to professional ethics in order to set down standards of good practice and codes of conduct for computing professionals.

A philosophical research avenue has also been dedicated to this topic since the seventies and called Information Ethics with a substantive effort to develop a profound reflection on the ethical impact of IS/IT on human life and society. The core of the debate here is not anchored on devices

and technical functionalities but on the ontological nature of information. Thus, philosophy of information has emerged as the meta theoretical underpinning of information ethics due to prolific philosophers like Luciano Floridi (1999a, 2006, 2008, 2011) and his information ethics approach. Floridi defines information ethics as follows: "an ontocentric, patient-oriented, ecological macroethics" (Floridi, 1999b, quoted by Floridi, 2010, p.84).

Ontocentric: relates to the informational ontology according to which any entity (human/non-human, material/non material) can be described as an informational entity i.e. a cluster of data.

Patient-oriented: and more precisely the Agent/Patient pair stands that any informational entity (the agent) produces, and/or undergoes (the patient) changes in the environment. Entities, agency, the environment and their interactions are equally described informationally.

Ecological macroethics: is about a constructivist approach in which:

> "ethics is not only a question of dealing morally well with the world. It is also a question of constructing the world, improving its nature and shaping its development in the right way" (Floridi and Sanders, 2005, p.2).

This ecological (rather than semiotic), constructivist, ontological and patient/agent oriented approach leads to what Floridi names *Infosphere* i.e. the environment constituted by the totality of informational entities. Infosphere is a conceptual abstraction: a way to describe and represent the totality of Being from an informational perspective. Thus, information ethics is about the design of the infosphere, and evaluates all agents' contributions to positively or negatively affect it.

Philosophy of information and the related information ethics approach are intellectually intriguing and have provided a strong framework to address several key theoretical questions of great philosophical interest, arising from the investigation of the ethical implications of IS/IT. These approaches have nevertheless been criticized (Capurro, 2008), globally for their high level of abstraction and also because of the informational ontologism according to which any hierarchy between informational entities has to be omitted when talking about information ethics. Brey (2008) refers to this as the 'untenable egalitarianism in the valuation of information objects' which he argues leads to the failure of Floridi' Information ethics to:

"provide us an essential ethical component, namely, a framework and/or procedure that allows us to distinguish between the intrinsic worth of two very different informational items —a distinction that is crucial in making many kinds of ethical choices" (Ess, 2009, p. 162).

In the MIS field, IT ethics seems to be in search of its meta theoretical underpinnings within the classical field of moral philosophy, as it is the case for other applied ethics domains such as business ethics or medical and healthcare ethics. Namely, deontological ethics, consequentialist or utilitarian ethics, ethics of virtue and pragmatic ethics constitute the major streams of philosophical thoughts which sustain IT ethics developments (Mingers and Walsham, 2010). They are discussed in chapter seven of this volume.

Besides philosophy, IT ethics investigations have so far been largely influenced by professional and technical approaches, addressing mainly legal, social, cultural and technological problems. Our concern in this book is to show how they could be complementary in shaping our understanding of what IT ethics is exactly about (in terms of the concepts at play) and to apprehend how social, business, educational or healthcare practices could raise ethical concerns.

This volume is the product of a reflection process carried out by scholars from multiple research fields on the following issue: *How human interactions with IS/IT could derive ethical implications?* A scientific workshop was held in the University of Paris Descartes to provide these scholars with the opportunity to meet together and confront their points of view. Participation in this workshop is the result of a double blind peer reviewing process of a number of contributions anonymously submitted to our scientific committee. The authors of the best papers have then been invited to contribute to this book.

Part I includes the contributions of our panelists and keynote speakers who have focused on the difficult question of the toolbox required to grasp IT ethical issues. They came together with the following questions: Do we have the adequate intellectual framework? Do we posit the pertinent questions? And do we have the legal, structural and institutional arsenal required to address these questions?

In chapter one, Alain Bensoussan puts forward a new concern: what happens if IT encompasses stand-alone and autonomous systems capable of thinking, acting and producing effects on the environment? We now recognize that this is not science fiction and that some of these

technologies exist and will develop rapidly in the next few years. A sustained support of Artificial Intelligence (AI) research over the past three decades has initiated the production process of intelligent technical beings: robots. Alain Bensoussan uses the law lens to apprehend the ethical implications of robots' integration in human life. He discusses the suitability of existing laws on robots and proposes new and original concepts, such as 'robot personhood', 'virtual persons' and 'cascading liability'.

Anil Aggarwal develops in chapter two the concept of NetEthics or ethics of Internet. With more and more people communicating via the Internet, along with the wide use of social media, it is important for stakeholders to understand Internet Ethics. Many organizations and societies (American Computing Machinery, American Accounting Association, American Medical Association, etc.) have codes of conduct that their members must follow. The Internet does not have any such code. It would be impossible to have a standard "global" ethic code, since the Internet is not controlled by any one entity. However, we can create an ethic code for certain stakeholders. This chapter is an attempt in that direction, and provides a study of NetEthics from one stakeholder's perspective, namely, the students in a western country (the United States).

The third chapter is devoted to a philosophical discussion of a central ethical issue raised by IS/IT usage: intimacy. For Pierre-Michel Simonin, the integrity of the individual has a legal and social form under the injunction of the protection of privacy. This notion that is sourced deep within Greek thought is far from simple. It seems to play with the constant ambivalence between open and closed; bridge and wall, what is shown and what is hidden. The author develops what he calls the paradoxes of intimacy and explains that any (cyber) individual seeking for a place in the digital world has to leave traces that s/he knows s/he cannot control. Intimacy becomes as such a grey box which s/he claims and implicitly defends without much knowing what to put into it.

In the second part of the book, the approach is different. Ethical issues emerge in specific contexts and require the implementation of specific solutions. It is therefore important to address each case with regard to its determinant factors. Healthcare, education and publishing are some of those social and business areas in which IS/IT are deeply integrated and recognized to raise moral and ethical dilemmas.

Nabil Bikourane, in chapter four, presents a thorough overview of the ethical implications of an IS/IT based healthcare system: the electronic

healthcare record. The author starts with a multi-disciplinary literature review, based on publications from many fields including medicine, law, economy, management, sociology and philosophy. Following an interpretive methodology, he analyzes how different stakeholders: namely the ethical committees, the medical and patient associations, perceive the role and impacts of the electronic health record in France (called DMP), especially on three aspects: the principle of autonomy, the respect of privacy and the over automation of the doctor-patient relationship.

IT ethics is not only about avoiding the negative effects of IS/IT development and use. Serge Bolidum and Isabelle Walsh, in chapter five, have focused on how IS/IT could help in eliminating the effects of impairments. They use a grounded theory approach (Glaser, 1978, 1998, 2013; Glaser and Strauss, 1967) to analyze the individual life stories of eight students in an engineering school who present various mental and physical disabilities. They have developed what they call the digital-life enhanced basic social process framework in order to show how the interaction between health conditions and social context constitutes a starting point for analyzing one's own main concerns. Especially for disabled people who are dramatically in need of regaining control of their bodies and minds. In a way, Serge Bolidum and Isabelle Walsh aim to prove that behind our laptops, avatars and social network profiles, we are all equal.

Chapter six is about IS/IT codes of ethics in educational and academic institutions. Gilbertine Ikili Ossana and Marc Favier propose to carry out a comparative analysis of IS/IT codes of conduct use in three universities in France. They argue that an organization may adopt a code of conduct and impose it upon collaborators to regulate their usage of IS/IT, but this does not necessarily mean that an ethical IS/IT framework has been established. In other terms, codes of conduct and codes of ethics are not synonymous. To assess whether a given IS/IT code of conduct use could be acknowledged as a code of ethics, the authors propose an adaptation of Johnson's framework (1985) according to which a professional code of ethics should be examined based on four types of obligations: obligations toward society, toward employers, toward clients, and toward colleagues and professional organizations.

Ethics in the digital publishing industry is debated in chapter seven. Hajer Kefi and Lamine Sarr provide the theoretical underpinnings to the understanding of the socio-material changes brought about by digital technology in the book industry in terms of practices and ethical issues.

Within a pluralistic research methodology, they put into practice a variety of research techniques (exploratory and confirmatory), which address usages, practices and perceptions of the stakeholders of the e-book chain.

All these contributions are part of different research projects. Each addresses IT ethics from a specific empirical lens. All build upon their own theoretical underpinnings.

The targeted readership of this book includes, but is not limited to, scholars and advanced students of philosophy, computer science, information theory, management information systems and related disciplines.

PART I:

CONCEPTS

CHAPTER ONE

ETHICS, LAW AND ROBOTS:
WHAT REGULATION?

ALAIN BENSOUSSAN

1. On the road to "singularity"

1.1 Developments in AI

Artificial intelligence keeps developing as demonstrated by technological advances. In 1997 a computer defeated world chess champion Garry Kasparov; in 2011 the Watson program beat the human champions of *Jeopardy*! [1]; and in 2014 a computer is said to have passed the Turing test[2].

Intelligent robots are gradually entering our everyday lives whether at home (do the cleaning, ensure home surveillance, keep an eye on children, take care of people, transport people, etc.), at work (greet customers, attend a board meeting, etc.) or in the street (autonomous cars). Intelligent robots are increasingly interacting with humans.

. Thanks to their sensors, robots exceed some human faculties: they can hear, see, and feel faster and better than human. And as the information processed by sensors can be cross-referenced with already existing data — through the Internet or Big Data —, robots will develop a gigantic analytical capacity.

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[1] A game show where contestants have to provide a response, phrased in the form of a question, thanks to the clues given in the form of answers.
[2] The Turing test consists in a human judge engaging in a "blind" conversation with both a human and a computer: if the human judge is not able to tell the computer from the human, the computer is said to have passed the test.

Futurologists and transhumanists like Ray Kurzweil[3],who have predicted that the changeover to the "technological singularity", i.e. the time when artificial intelligence capacity will exceed human intelligence capacity, will occur in the third decade of the 21st century, around 2035.

In fact most industrialized states now consider that robotics will be the next frontier of technological revolution by 2020. However, the road to this revolution can be a treacherous journey filled with many ethical, legal and standard obstacles.

1.2 The ill-suited rules of property law

Robots have not yet found their place in our legal system. Robots with artificial intelligence do not easily fall into the category of material goods. Property law is thus not adapted to robots. Nor can the law of persons be appropriate as for now.

Today, the legal and regulatory framework in France or in Europe does not accommodate robotic activities. A new framework is therefore needed: a law of robots, falling somewhere between the law of property and the law of persons.

As robots will be required to interact with humans, both in the public and private spheres, a myriad of issues and concerns raised about their rights, duties and liability.

Amid the lack of an appropriate legal framework, several countries have adopted ethics policies to remedy shortcomings in the law.

1.3 The role of ethics

Adopting an ethical approach in building a law of robots is essential, as the rule of ethics and the rule of law inevitably overlap. Let's look at a textbook case: imagine that a driverless car, closely followed by a car with children wearing no seat belt, is about to hit an elderly crossing the street. If the driverless car brakes it avoids the elderly in front but the children in the car behind could be ejected because of its sudden braking.

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[3] Ray Kurzweil, "Your Robot Assistant Will Be Able to Do What No Human Can Do" http://bigthink.com/videos/ray-kurzweil-your-robot-assistant-will-be-able-to-do-what-no-human-can-do via @bigthink

In a situation like this, how can a smart car choose between two items of damage? What criteria must be paramount in its decision-making process? The debate is open, but a critical element in the quest of a solution will be to take into account the fact that humans and robots do not have the same computing power.

The famous Three Laws of Robotics by the science fiction writer Isaac Asimov are food for thought:

> 1) "A robot may not injure a human being or, through inaction, allow a human being to come to harm.
> 2) A robot must obey any orders given to it by human beings, except where such orders would conflict with the First Law.
> 3) A robot must protect its own existence as long as such protection does not conflict with the First or Second Law[5]"

If at first glance, these Three Laws seem to be infallible, they are subject to misinterpretation. In fact, their strict application can lead to harmful behaviors for human, as Asimov shows himself in his science-fiction books. Therefore, they should be adapted to our current legal and ethical system.

1.4 The role of policies

Policies or charters can serve as a useful tool in the construction of an appropriate legal framework to try and iron out legal difficulties without waiting for lawmakers to act.

In France the Ministry for the Economy, Industry and Digital Affairs is drawing up a non-binding draft charter of ethics. Other organizations and institutions have been elaborating for years on these issues, including the Strategic Business Division of the Department of Defense, the Research Centre of Saint-Cyr Coëtquidan schools (Crec), the Atomic Energy Commission (CEA) or the National Institute of Health and Medical Research (Inserm): various projects are in the pipeline.

In Europe, the euRobotics coordination action financed by the EU Commission has proposed to grant third-generation robots an "Electronic personhood".

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[5] Asimov, Isaac (1950). I, Robot.

Other countries — South Korea, Denmark, Japan and the United States — have adopted ethics charters applicable to robots and droids.

For my part, I have created a Charter on Robot Rights introducing a legal status for robots, where robot duties and rights are enshrined, such as the right to respect, the right to dignity and the right to identification[7].

While ethical reflection should not be overlooked, especially when it comes to human- or animal-like robots, it cannot make up for the instauration of a body of legal rules able to reshape the concepts of person and personal identity.

2. The robot "personhood"

The introduction of artificial intelligence goes hand in hand with the introduction of a specific law, the foundation of which will be the creation of a suitable legal status, a singular legal personhood specific to robots and resulting from their interaction with humans.

2.1 The
concept of "robot personhood"

The solution should consist in devising a suitable legal status for robots, inspired from the one used for legal persons. The Legal personhood is a purely legal construction designed to meet practical needs and grant legal access to structures that have no physical existence, such as corporations, associations or trade unions.

With legal personhood, legal persons are granted rights, much like natural persons: they can own their own assets, open a bank account, take legal actions to protect their interests or obtain indemnification   for damage suffered, including moral damage (i.e. damage to their image or reputation).

A similar approach should be considered for robots. The creation of a "robot personhood" is all the more justified since robots are acquiring an increasingly significant degree of freedom in relation to their environment and to the humans who use them.

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[7]   Available   at: http://www.alain-bensoussan.com/espace-cabinet/equipe/alain-bensoussan/

In the same way, robots could have the right to obtain an identifier and could be assigned code "3". This could be a way to build a database or portal inventorying all intelligent and autonomous robots acting in an open environment (or, put otherwise, robots that are in contact with the public).

A robot's purpose is to operate autonomously in a closed or open environment, in cooperation with humans.

Granting robots a personhood with an ID number is pivotal for managing liability, whether for the robot, its manufacturer, supplier, user, or its owner.

2.2 Components of the "robot personhood"

When the robot operates in an open environment, it can interact with anyone. It is therefore essential for the robot to be recognizable: it needs a registration number, a name and a capital, much like a corporation. In case the robot causes damage, legal recourse and remedies must be available to the victims.

The creation of a robot database identifying all robots acting in an open environment will contribute to the emergence of a law of robots.

2.3 Privacy issues

Robots should have obligations; but they also should have rights. Including the right to privacy, as robots can collect data about the health and privacy of the individuals they are interacting with.

For example a robot is able to tell a person with Alzheimer's disease "The birthday of your grandson is coming soon", or to a child with autism: "Here comes your brother," or to an elderly: "Your granddaughter is here." Protecting the privacy of individuals means protecting the memory of the robot.

The pervasive influence of robots in our private lives will raise a variety of questions relating to the confidentiality of the data they may save and/or process. For now these issues are governed by the Data Protection Act.

But robots — particularly service and assistance robots— will become "intimate hubs" of the life of their user, and the Data Protection Act may not be sufficient to regulate the informational cooperation that will be created between an individual and their robot.

Likewise, robots processing personal data should be protected against the risk of security and data breach. Legislation should therefore be strengthened in this area.

In France, the law relating to computer fraud (included in the French Criminal Code) should be applied to robots, as they fall within the category of automated data processing system within the meaning of such law, even if robots cannot only be reduced to that.

However, the French Criminal Code, which punishes computer fraud (unauthorized data access, retention, handing or misuse) with prison sentences, was initially created for computer equipment and may require some adjustments in order to be extended to robot fraud.

2.4 Obstacles linked to civil liability

The issue of liability is vital for the robotics industry. . As the degree of robot's autonomy increases, the issue of its civil liability will rise. When the decision taken by a robot causes harm to a person, who is responsible for what, especially in case the robot is defective?

A robot is a machine cooperating with the humans, operating in a private or public space, having learning abilities, capable of taking independent decisions and interacting with its environment. This brings new issues regarding liability and risk of accidents (e.g. when a robot drives a car; when a robot cooks…).

However, the regime of civil liability specific to robots does not exist in the actual state of law. For instance, the Three Laws of Robotics are actually principles used to form a system of values (a robot shall not endanger a human) and do not offer a workable legal framework in terms of liability. They are insufficient per se to regulate robotic activities as they fail to establish a legal qualification.

2.4.1 From fault-based liability to liability without fault

The notion of liability, such as defined in the French Civil Code, is closely linked to human fault. Case law has always refused to attribute a harmful event to a machine — however smart it was — since it is not considered to be the author of the event. Indeed, liability is linked to the concept of autonomy in the decision making.

In the early nineteenth century, the multiplication of accidents caused by machinery gradually changed liability law into a right to compensation.

Judges established the presumption that machines (including automobiles) were dangerous. The relentless search for security has changed the law from "fault liability to liability "without fault" (strict liability[8]) in order to respond to the problem of compensation for damage caused "by things". With technical progress, the concept of "things" has been interpreted more and more broadly.

2.4.2 Strict liability

Two kinds of liabilities may apply to machines under French law, depending on the origin of the damage: whether liability for damage caused by a manufacturing defect (strict liability for defective products under the French Act of May 19, 1988[10]) or liability for damage caused by an interaction of the machine with its environment.

Liability for defective products refers to the situation where a manufacturer is held liable for the lack of safety of one of its products that caused harm to a person.

Regarding the second type of strict liability, the one who controls the machine is deemed to be responsible (as long as there is no malfunction).

For "autonomous" machines, i.e. machines able to respond on their own to the environment and to unexpected situations, there is today a legal vacuum regarding liability to the extent that it is impossible to determine who is liable.

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[8] Please note that strict liability under French law is different from the concept of strict liability under common law.

[10] Act 98-389 of May 19, 1998, on liability for defective products (.French Civil Code, Art. 1386-1 and seq.).