Ethics of AI Technologies and Organizational Roles: Who Is Accountable for the Ethical Conduct?

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Abstract. Artificial intelligence (AI) is recognized to have the possibility to transform many fields in our society and business environment. In addition to discovering the positive impacts, multidisciplinary research about ethical concerns related to artificial intelligence should take place.

The rise of AI ethics sets new questions for management studies. New ethical demands drive organizations to introduce new practices, routines, and roles. In recent years the AI ethics community has focused on the principle-level work resulting in manifold documentation. It is a crucial task for management studies to convert these findings into organizational practices.

A part of management studies' task is to answer who should take responsibility for the ethical queries. Role-specific, systematic and agency-based approaches offer different views on organizational roles and practices to this ethical challenge. Arguing from the role-specific approach, the emerging roles of AI ethics could build-up to the boundaries between programmers, designers, and compliance personnel.

The article presents a limited interview data to support future research. The interview results are compared to the theoretical background of role-theoretical view of organizational roles, and the earlier literature regarding ethics management. Additionally, the article discusses the three categories proposed by Wilson et al. (2017) and reflects those with the theoretical insights and the interview data.

Keywords: Ethics of artificial intelligence, organizational roles, corporate social responsibility, responsible AI

1 Introduction

Artificial intelligence (AI) is recognized to have the possibility to transform many fields in our society and business environment (Stanford, 2016). In addition to discovering the possible positive impacts, multidisciplinary research about ethical concerns related to artificial intelligence should take place (Russell, Dewey & Tegmark, 2016). Even though few ethical questions raised by the AI are familiar from the tradition of information technology ethics, especially from the famous PAPA model (Mason, 1986), all the questions are presented in a novel light and with prior importance.

The rise of AI ethics sets new questions for management studies. New ethical demands drive organizations to introduce new practices, routines, and roles. The last few

years the AI ethics community has focused on the principle-level work resulting manifold and primary documentation, including IEEE Ethical Aligned Design (2018), ACM Code of Ethics update (2018), AI Now Institute's report (2018), An Ethical Framework for a Good AI Society (Floridi et al., 2018) and European Union's High-Level Expert Group´s "Ethics guidelines for trustworthy AI" (2019). It is a fundamental task for the management studies to convert and execute these findings to organizational practices.

This article presents conceptual ideas regarding organizational roles to answer the rising demand of ethical conduct. A little literature has been published about the specific question of the organizational roles disclosed by AI ethics. However, the long tradition of compliance and business ethics literature, like organizational roles and organizational citizenship related to the environmental responsibility (Boiral & Paillé, 2012), and the realized managerial proposals of information technology ethics (Jin et al., 2007) offer starting blocks for outlining the ethical roles for the era of artificial intelligence. Due to the limited literature tackling the call of AI ethics directly, the article by Wilson et al. (2017) "The jobs that artificial intelligence will create" has been very impactful.

The emerging roles and practices of AI ethics could build up to the boundaries between programmers, designers, and compliance personnel. This article approaches organizational roles through role theory, and present three more detailed perspectives for creating roles in an organization.

Additionally, the paper analyzes the three principal categories and nine sub-roles proposed by Wilson et al. (2017) and reflects those with the theoretical background and earlier literature. The analysis is supported by a brief interview data collected from ten representatives of ICT vendor companies (see References). The paper offers conceptual insights on questions regarding the integration of AI ethics with organizational roles: In which part the ethical conduct required for AI solutions can be managed within the existing roles? To what extent new ethical demands can be integrated into the existing roles via training and educational change? Are new organizational roles of ethical conduct required?

This article assumes that responsible business, corporate social responsibility (CSR), and ethical conduct in overall are profitable for businesses. This proposition of stakeholder theory stays partly debatable (Weitzner & Yuval, 2019) despite the strong evidence to the positive effect of the responsibility (Jin & Drozdenko, 2010). With this assumption, it should be clear that aligning ethical conduct to all the AI solutions and practices an organization has, should be a positive action for the organization's outcome. Ethics of artificial intelligence is a clear continuum to other themes of responsibility, and a driving force for the changes within business ethics and responsible business.

2 Theoretical background

2.1 AI/ML technologies and ethics

Artificial intelligence (AI) refers to different techniques and technologies like machine learning techniques, recognition technologies, and machine reasoning. Widely used

term AI/ML refers to the dominate position of machine learning techniques in applications which are called AI. As general-purpose technology, AI affects various industries, application areas, and other fields as for example robotics. AI equips the robots with capabilities to react, learn, and act based on the events in their environments.

Definition of AI is still under debate - and often challenged by the computer scientists and engineers - but some baseline specifications of AI will make the societal and ethical discussion more valuable. The definition of AI by the European High-Level Expert Group is a good starting point:

"Artificial intelligence (AI) refers to systems that display intelligent behaviour by analysing their environment and taking actions – with some degree of autonomy – to achieve specific goals. AI-based systems can be purely software-based, acting in the virtual world (e.g. voice assistants, image analysis software, search engines, speech and face recognition systems) or AI can be embedded in hardware devices (e.g. advanced robots, autonomous cars, drones or Internet of Things applications)."

The European Guidelines for Trustworthy Artificial Intelligence offers a good opportunity to adapt the presented ethical principles and requirements into more practical level. The European High Level Expert Group's report "Ethical Guidelines for Trustworthy AI" describes seven high-level principles and ethical categories as the key requirements of ethical AI: *Human agency and oversight, Technical robustness and safety, Privacy and data governance, Transparency, Diversity, non-discrimination and fairness, Societal and environmental well-being and Accountability.*

2.2 Organizational roles for ensuring ethical conduct and responsible business

Regarding ethics of AI, part of management studies' task is to answer who should take responsibility for the ethical queries and customs. Although the ultimate responsibility is placed to the management board and compliance department, liability carriers are likely and should be found in other roles as well. An intriguing puzzler is whether the ascending ethical demand can be fulfilled by the existing organizational functions via effective retraining (i.e., Furey & Martin, 2018; Goldsmith & Burton, 2017) or will new roles of ethics emerge. In either case, integrating ethical thinking into an organization's AI practices is required to achieve the full benefits of these technologies.

In this article, organizational roles are understood in light of the role theory. The role theory describes organizational roles as a collection of roles, which most likely fits perfectly to the situation in the ICT companies. The exact roles vary based on the situation, environment, and organization. The role theory also states that the content of roles is socially constructed. (Knight & Harland, 2005).

Based on the earlier literature, the organizational roles related to ethical conduct are introduced from two perspectives. First, the view of corporate compliance and CSR literature presents a few specific organizational roles, especially from the field of environmental responsibility and management. For example, this view presents roles like environmental manager, compliance manager and ethics officer. Second, the earlier research in the information technology ethics shows few examples of how the responsible

conduct has been organized in the ICT industry. The literature from the perspective of ICT is limited.

Regarding the compliance and CSR view, it is unsure if the requirements of ethical AI can be fulfilled and complied with the current roles like sustainability or compliance manager. This assumption could be supported primarily by two qualities:

1. The current content of the roles does not fit: fulfilling the requirements of ethical AI can demand an in-depth understanding of the technology and technological nature of AI ethics
2. The current form of the roles does not fit: aligning AI solutions with ethics might require organizational roles with entirely different nature compared to environmental manager or compliance officer roles

The literature about environmental management is relatively developed. For categorizing the field considering organizational roles, three different approaches related to environmental management can be found:

1. Role-specific approach (ie. environmental managers, sustainability managers) (Organ et al., 2006; Greenwood et al., 2012)
2. Agency-based approaches emphasizing the impact of every individual of the organization (Andersson and Bateman, 2000; Boiral & Paillé, 2012)
3. Systematic approaches (i.e. environmental management systems which shares the responsibility systematically between the organization members) (Sroufe, 2003).

The role-specific approach settles clear; environmental responsibility is managed by environmental managers or expert within the organization. The view based on the role theory fits well to the approach, the exact role of environmental manager can vary a lot in different organization. The history of environmental managers also includes a shift from the compliance-based conduct to the more responsible and leading role within the organizations (Greenwood et al., 2012).

The six main categories of organizational citizenship behavior described in a general form by Organ et al. (2006) and targeted again to the environmental theme by (Boiral & Paillé, 2012) are principal elements of the agency-based approach. Helping, sportsmanship, organizational compliance, individual initiative and self-development are the ways to encourage environmental progress within an organization by an individual. For the agency approach, the importance of sharing tacit knowledge has been recognized (Boiral & Paillé, 2012), and the approach also relies on the teamwork and team effort (Remmen & Lorentzen, 2000).

Environmental management system refers to the systematic approach in environmental issues: all the organization's processes and functions, management structures and roles, and resources are mapped regarding the environmental impact and protection (Sroufe, 2003). Relating to organizational roles, practical implementation examples can be found by various institutions (St. Elizabeth Medical Center; 2008; University of Gothenburg, 2016).

Based on the earlier literature, the organizational roles and practices attached to the ethics of information technology are far less developed than in environmental issues.

The phenomenon is natural as the roots of the modern environmental concerns go to the middle 20th century, and the information technology ethics started not until the 1980s. The two main topics rising from the literature are roles of data privacy & security personnel (Chen & Zhao, 2012; Clearwater & Hughes, 2013) and professionalism (Bynum & Simon, 2004).

Data privacy has been one major topic for information technology ethics, starting at the latest from Mason's article (1986). Privacy is a permanent topic, also in all the AI ethics guidelines and reports. From the earlier literature, data privacy has been a rare topic to be also viewed from the perspective of organizational roles: data privacy officers are the closest equivalence to the environmental managers. In other cases, privacy, security, and product safety issues have belonged to the safety officers or compliance managers. However, these roles might sound compliance-focused, the need for more pro-active grip for the privacy issues has been recognized (Kleindienst et al., 2017).

One crucial perspective rising from the tradition of ICT ethics for organizational roles is professionalism. Various professions rely on robust professional ethics code, and that is a discussed topic also within the information technology practitioners (Bynum & Simon, 2004). However, considering the literature, it is far from saying that professionalism in the ICT industry would be established. The professionalism of the ICT industry relies on a few public codes (for example, ACM and IEEE), but these offer just high-level principles for developers' work.

A question rising from the professionalism is that if all the ethical issues related to applying AI technologies are in the responsibility of the developers. In turn, many AI ethics questions come down to broader societal problems which might require advanced ethical knowledge. Besides, the relationship between developers and other roles involved in the AI ethics questions remains unclear. An old example from the public relations industry offers us two main categories of the roles within the industry: Communication Manager Role and Communication Technician Role (Dozier, 1984). A similar situation could be the case in the information technology industry, between project managers and developers. Another example from the public relations offers valuable information on how roles possibly change due to technological development: the personnel in communication technician roles or early practitioners in the industry took the more substantial role in the social media expertise when these platforms became important (Lee et al., 2015).

2.3 Roles created by AI – Trainers, Explainers and Sustainers for Ethical AI

"Humans in these roles will complement the tasks performed by cognitive technology, ensuring that the work of machines is both effective and responsible — that it is fair, transparent, and auditable."
Wilson et al. (2017)

Wilson et al. (2017) present three categories of jobs the era of AI technologies would create: trainers, explainers, and sustainers. Briefly, the categories can be explained as following: *Trainers* train AI systems to behave in a desired way, including detecting

and understanding the nuances of human behaviour; *Explainers* would work as an interpreter between technology and decision-makers in the situations when the function or conclusion of the technological solution should be explained; *Sustainers* would work as maintainers of the AI systems, for example ensuring fairness, auditability and safety of the systems even after an extended period of run time. (Wilson et al., 2017).

As stated in the quote above, Wilson et al. (2017) give a weighty position for the roles which are related to keeping AI systems ethical and responsible. Not all the jobs introduced take part into the ensuring of ethical conduct and practice, but the original text presents a few examples: *Worldview trainer, Transparency analyst, and Automation ethicist.*

As reflecting the three example job titles to the roles related to environmental concerns, inter-organizational nature of these jobs seems necessary. As the ethical discussion is on a full-time relationship with the surrounding society, inter-organizational bonds are required. When analyzing the roles presented, it should involve the notion that the responsibility of inter-organizational relationship is also usually given for an individual within the organization (Janowicz-Panjaitan & Noorderhaven, 2009).

All the presented roles – worldview trainer, transparency analyst, and automation ethicist – clearly land to the role-specific approach in solving the ethical concerns related to AI technologies. However, there is no evidence that the skills and tasks specified to these roles could not be utilized through agency-based or systematic approaches. Ethics officers could have a clear impact to the organizations if relying on the evidence from the environmental practices (Greenwood et al., 2012), but having a strong teamwork culture and a systematic responsibility allocation would help to ascertain the ethical development of AI solutions.

3   Empirical research

3.1   Method

Ten informants from the IT/AI vendors was interviewed for the research. The informants possess significant expertise on AI/ML, data science or information technology in general. All the informants work in the Finnish IT companies which have demonstrated an active progress and participation to the development and implementations of the AI/ML technologies. The emphasis is on the companies which can be called as "vendors", referring to the companies which provide their AI/ML development services for their clients' projects. This definition excludes the product companies which use AI/ML technology, but for their product or service. However, the informants represent themselves and the interviews were told to be anonymous expert interviews.

The semi-structured interviews were conducted in Spring 2018. The interviews had a defined structure and questions, but open-form answers were accepted and encouraged. The answers are presented as purely descriptive and no further analysis has been run over the answers, due to the exploratory and preliminary nature of the research. As part of a larger interview structure, three specific questions related to this article were:

1. Defining the roles of the team in machine learning projects

2. Which role is taking the biggest responsibility of ethical risks

3. The need for personnel focusing on ethics

3.2   Interview results

The roles in a team of AI/ML projects

The first question asked to define the operational teams involved in building AI/ML solutions. The answers varied, but the most defining factor for this was the size of the company. The core roles of the AI/ML teams are data scientists and AI engineers. These roles are working with the technical side of AI/ML projects. Their tasks start from the data collection, evaluation and cleaning and end to the AI/ML development including model planning, implementation, and the production management of the AI/ML solutions.

In smaller companies or teams, the roles of data scientist and AI engineer can be combined. The smaller the company, the closer to the clients are technical experts operating. Based on the interviews, all the AI/ML teams were relatively small, containing maximum 4-5 technical experts. The results can be different in the future as the AI/ML projects became larger.

Some of the larger AI/ML solutions and systems can be based on the work of various development teams. One team can focus on data analytics and finding new useful insights from the data. Another team can be doing only AI/ML developing work. This separation of teams can be used to distribute different parts of the project between the teams. For example, one team can focus on building a machine vision module for the project, and other is focusing on the voice recognition part.

The technical group is still just a small part of the whole team. Based on the informants' answers, especially the project management is essential in most projects. In smaller companies, the entire team is smaller, but someone is taking the responsibility of the project management nevertheless. According the informants, the planning, design, and management of AI/ML projects might become a more essential part of the projects than in the earlier ICT projects.

Which role is taking the biggest responsibility of ethical risks

To the second question, the informants offered identical answers: usually, every person of the project shares the responsibility for identifying, managing, and taking responsibility for the ethical risks. However, this might be partly a fault of the formulation of the question, the answer is overly obvious. In turn, of course, it is crucial also that every person involved in the development are aware of and influencing the ethical side of AI/ML projects.

From the additional comments for the question is possible to find some diversity for the answer. One informant emphasized the role of the person working with data over the others, and that can be a good observation for the question. Data itself might contain many problems causing ethical concerns. The person who is responsible for choosing, modifying, cleaning, and inputting the data for the project can have an extensive responsibility in the sense of ethical conduct.

It was emphasized that in smaller companies, the final responsibility of ethical conduct is at the upper management, meaning CEO or equivalent. Though juridically the situation is the same in larger companies, the respondents from larger companies were referring more to the responsibility of the development team in their answers. Some respondents left the most significant responsibility for the project managers.

The need for personnel focusing on ethics

The informants were asked, if they could see new organizational roles emerging to response the demand of ethical conduct for AI/ML solutions. Most of the respondents emphasized the need for integrating the ethical evaluation and thinking to their all operations and personnel over the option of having a named expert focusing on the issues.

Some of the respondents saw a possible need for technology ethicists and ethics officers in the future. These answers were attached to the size of the company: in larger companies, these roles could be possible. The ethicists and ethics officers could be compared or held equivalent to the lawyers or legal advisors in the companies.

The pressure for ethical officers or equivalent might come with future regulation. Already now, the GDPR requires companies with over 250 employees to have a representative who has the responsibility for the data protection. The answer to this question did not define the respondent's opinion of the need for AI/ML ethics. Some of the respondents highlighted the value and urged for better ethical understanding, even not seeing a reason for separate ethics roles.

4 Discussion

Ensuring ethical conduct and aligning ethics into all AI/ML solutions is necessary for all organizations. The current challenge is to find out how principle-level guidelines and ethical codes should turn into practice. This paper argues that defining organizational roles – whether from role-specific, agency-based, or systematic approach - which will help to take these guidelines into practice.

The evidence of agency-based advocation presented in the CSR literature probably translates into the practices of ethical AI. Individuals promoting ethics of AI within the organization will surely have an impact at least to the organizational knowledge around the topic. The brief interview data supports the view that the ICT/AI industry is still at the phase of knowledge collection and awareness creation. The agency-based approach fits this observation as it might be enough for many ICT/AI companies to have a few individuals interested in ethical consideration and active knowledge acquisition around the topic.

When looking the from the systematic perspective, the possible shortcomings are most likely to be found from the operational level (i.e., developing practices, ethical alignment for project management). The higher level's needed attention towards AI ethics contains relatively many familiar issues for the top management. As the work of

the AI ethics community has focused on the high-level principles, more empirical analysis and evidence is needed for a systematic, organization-wide scheme for the ethical alignment of AI solutions.

The job titles presented by Wilson et al. (2017) give interesting insights on what kind of organizational roles could ethical AI need. The job titles might not come true, but the content described under the roles can be valuable in consideration of the roles necessary for ethical alignment in AI solutions. The open question is that if all the roles (or their content) can be integrated to one single organizational role, for example ethics manager, or should the responsibility of the tasks be divided between ethics manager and ethics technician levels.

This paper is limited to conceptual insights for future research. More considerable empirical evidence about the present situation in organizations would help to research and design better organizational structures, practices, and roles for the ethical alignment. However, the current debate of ethical AI has not shown further attention on the organizational and managerial questions. The AI/ML ethics community should show interest to this direction and give AI organizations a clearer pathway for ethical alignment in practice.

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