Clarifying Privacy, Property, and Power: Case Study on Value Conflict Between Communities

Based around a case study on the "flaming" of fan fiction, this paper aims to clarify notions of privacy and draw lessons for the ethical governance of AI in the presence of value conflicts.

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ABSTRACT | This study analyzes the value conflict of a paper on fan fiction writing that used online fan fiction novels as a source to extract and filter sexual expressions from text. The boundaries of public and private information are ambiguous because users are not always aware of or have agreed to the fact that their content is to be used openly. The case was complicated by the fact that the use of these data by researchers violated an unconsciously infringed upon right of a vulnerable community with a weak legal position. This paper describes the debate on this topic among researchers from engineering and humanities fields on whether the purpose of the research was ethically acceptable; how the systems can be embedded in ethical values; and what ethical, legal, social, and educational lessons are appropriate for governance of artificial intelligence (AI). Our analysis aimed not only to clarify the abstract concept of privacy but also to make changes to the submission guidelines for authors. We hope that our analysis contributes to the governance of ethical AIs and AI ethics on handling sensitive aspects of online activities.

KEYWORDS | Ethics; intellectual property; privacy

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I. INTRODUCTION

Discussions on artificial intelligence (AI) and ethics are carried out within and between governments and academic and NPO/Network institutions worldwide [1]. For example, in Japan in 2016, the Institute for Information and Communications Policy (IICP), one of the institutions of Japan's Ministry of Internal Affairs of Communications (MIC), organized the Conference on Networking Among AIs with approximately 37 participants, consisting mainly of academic researchers in a wide range of fields. The concept of "AI networking" refers to networking among AI systems, and in 2017, the successor committee named the "Conference Toward AI Network Society" released the AI R&D Guidelines with nine principles for international discussions [2]. The guidelines aim to protect the interests of users and deter the spread of risks, thus realizing a human-centered "Wisdom Network Society" by increasing

the benefits and mitigating the risks of AI systems through the sound progress of AI networks. Principle 1 is the "principle of collaboration." It concerns the development of AI networking and the promotion of the benefits of AI systems. Principles 2–7 deal primarily with the mitigation of risks associated with AI systems through concepts such as the "principle of transparency," the "principle of controllability," and the "principle of privacy." Principles 8 and 9 emphasize improvements in user acceptance. These guidelines were presented at the G7 ICT Ministers' Meeting in Takamatsu, Kagawa, Japan, leading to the formulation of the G7/8 ICT Ministers Meetings' Statement in Turin, Italy, in 2017 [3].

In addition to the government, academic societies have been discussing AI ethics as well. The ethics committee of the Japanese Society for Artificial Intelligence (JSAI) released the "Japanese Society for Artificial Intelligence Ethical Guidelines," prioritizing "contribution to humanity (Article 1)" as its most important objective [4]. The guidelines consist of nine articles created first as a Code of Ethics. Therefore, they include professional ethical guidance such as "Abidance of laws and regulations (Article 2)" and "respect for the privacy of others (Article 3)."

Along with international guidelines and principles such as the "IEEE Ethically Aligned Design Version 1" report and Asilomar AI Principles by Future of Life Institute, the Japanese guidelines and principles share common values, including the protection of human rights and privacy—understanding, however, that the concept of privacy and the need to protect it differs [5]. Additionally, questions are raised about whether these abstract guidelines can actually address urgent ethical and legal problems relevant to this field.

To understand some of these common values and consider the ethical and legal issues that may arise in reality, we introduce and discuss a case that arose in Japan. The structure of this paper is as follows. Section II describes the outline of the case, and Section III introduces the background of the incident through related previous studies. Section IV describes some topics that are extracted from an interdisciplinary discussion by a team of engineers and humanity researchers, and Section V describes lessons learned from the case.

II. CASE STUDY ON VALUE CONFLICT

In this study, we discussed a case that arose in response to a research paper that analyzed fan fiction which was posted at the domestic congress of a Japanese Computer Science Society X in 2017. Because this research itself includes ongoing projects and sensitive themes, we anonymized the related academic societies, organizations, and speakers to avoid identifying the involved actors.

The incident began when researchers from University Y, including graduate students, presented their fan fiction study during Society X's computer science-related annual conference. We refer to this day as Day 1. The theme of the research was techniques used to filter obscene expressions

from text. The core idea was as follows: generally, words in text have multiple meanings, including suggestions and implications, and some kinds of fiction use words that are generally reserved for obscene purposes for several other purposes. Thus, the word-based filtering approach commonly used as filtering technology is ineffective. The authors used samples of fan fiction that were posted on Site Z as source text. They collected ten samples from the site's ranked list, and manually analyzed expressions appearing in the text. Eight of ten pieces of fiction described homosexual relationships of male characters in famous Manga and Anime series (called Yaoi in Japan and slash fiction in the United States [6]). In the abstract, the authors stated that their purpose for detecting obscene expressions was to eliminate information that might be "harmful" to young people. The paper, in which the authors referred to the story title, listed fan fiction writers' account names, and inserted links to the manuscript, was uploaded to Society X's annual report page. At Society X's annual conference, organizers performed only brief checks on the title and abstract before uploading the entire paper online for public access. The same procedure was followed for this paper.

After the presentation, several annual conference participants posted short comments on Twitter. Tweets about presentations are permitted and appreciated by Society X. The fan fiction writers or fans of these manuscripts realized that their content had been used in the paper as a sample. They tweeted feelings of fear and anger at the authors' insensitivity (from Day 1 night to Day 2). Online news media reported this incident and more than 35 000 tweets were reported on Day 2. Additionally, several tweets reported that eight of the fan fiction writers had deleted their novels from Site Z. Several other writers on Site Z also deleted their novels.

Based on the above reactions and discussions on Twitter and blogs, Society X organized an emergency meeting and decided to remove the paper from their annual conference website (however, the abstract of the paper is still available on the website). On the evening of Day 2, Site Z commented on the fact that their site's intellectual property had been reprinted on the site, and they contacted University Y to confirm the fact.

III. BACKGROUND OF THE CASE AND RELATED STUDIES

A. The Fan Fiction Environment in Japan

First, we explain Japan's fan fiction environment to underscore the tinder that incited such flames. The ecosystem of subcultures including Manga, animation, and young novels in Japan is supported by fan actions including fanfiction's so-called secondary creations. In the fan-fiction movement, fans write and draw new stories reusing characters and scenarios from existing works. They create communities and exchange their own works with other fans based on social network service (SNS) platforms [7].

The legal position of such fan fictions is ambiguous. In Japan, if the original creators thought that their copyright was infringed, they would need to sue the violators. However, some authors specifically permit others to use their characters and scenarios [8]. For example, vocal synthesizer software company Crypton Future Media Inc. permits users to create content using their characters except for sexual purposes [9]. These situations blur the boundary between official and fan fictions, and also between public and private works. For example, it is sometimes difficult to distinguish between official works and fan works, and some companies support these online fan activities as business—Site Z is one such business company.

In the fan fiction community, one of the biggest groups is Yaoi or Boy's Love (BL), which deals with the theme of love affairs between men [10]. BL is basically a form of fan fiction dominated mostly by female writers and readers. Content deemed "harmful" is generally Lolita material directed at boys and men; however, in Japan, the BL genre, which is popular mostly with girls and women, is also contentious. In 2010, disputes over a series of amendments to the Tokyo Metropolitan Ordinance Regarding the Healthy Development of Youth Bill were raised. Known as "The Non-Existent Youth Bill," it was thought to increase the power of bureaucrats to make decisions concerning representations deemed "harmful" to young people. It also included provisions to install filtering devices on mobile phones used by young people. This bill faced opposition from manga artists and publishers. One of Japan's most famous manga artists, who is also a BL writer, claimed that the wording of the bill was so vague that her own classic and popular manga could fall under its regulations [11].

Given that BL often contains sexual elements, the BL community is generally extremely cautious about representing their work outside the community. In addition, the normative discourses encoded in government policies and media that force girls to keep being "pure" in preparation for their future roles as wives and mothers run contra to the "transgressive desire" that enhances the community's bonds [11]. This is also true for online community activities for which they tend to require strict access control. There are two kinds of control: one by age set by the site and the other by fans tagging jargon (e.g., an ordinary fan uses a character's name, but fan fiction community uses a combination of initials and symbols) to filter out people outside the community who possess unwelcome curiosity. There is a culture of avoiding searches using deliberately used homonymous terms differently, in order to avoid complaints by people outside the community searching for themes they prefer. Therefore, the paper submitted to Society X aimed to filter out "harmful" expressions using metaphors.

B. Boundaries of Public and Private Data and Ethical Guidelines

This case was a good example to illustrate the controversial problem of privacy, particularly in the sensitive areas of creation, even though the concerned content is public. Internet technologies allow human communication to become significantly more tractable and observable. SNS and other networking services attract users to upload their activities online, eliciting social rewards. These online content platforms are a good research source and can be considered valuable for evaluating and analyzing society's activities [12], [13].

However, we also need to carefully ensure that these public texts are not merely open information for research. Several researchers have voiced their criticism that the binarized notion of public and private is not relevant to today's internet environment [14], [15]. In 2008, a group of researchers released profile data collected from Facebook accounts of U.S. university students, leading to a controversial discussion [16]. This mismatch between users and researchers requires new ethical guidelines for conducting online studies [17]. Regarding the handling of information on the internet, the Association of Internet Research Ethics Working Committee provides guidelines on online human activities [18].

Our viewpoint on the abovementioned paper is that user attribution as well as user content generates such discussions on the border between public and private. These situations become critical in studies on user-generated content (UGC). Generally, every piece of published fiction must be separately accepted and criticized from the author's private attribution in a literature context. The author's privacy is protected when his/her name is anonymized using a pen name. However, such published content may be regarded as private content, particularly in sensitive fiction by minorities. Guidelines have begun to be formulated in fan studies, and obtaining permission of the cited fan work or blog post is strongly recommended to protect fan sources [19]. An important issue is how to design an online space where private and public spaces are mixed, particularly in the field of UGC where users request feedback by publishing content and such feedback contributes to the creation of further content. Given these circumstances, it is a particularly difficult challenge to design a system that ensures privacy.

IV. DISCUSSION

A. Research Group

To conduct our research, we organized an interdisciplinary team of humanities researchers [ethics, philosophy, gender studies, sociology, anthropology, science, and technology society (STS)] and science and engineering researchers [artificial intelligence, natural language processing, multiagent system (MAS), and human–agent interaction (HAI)]. This research team was based on a special working group titled Acceptable Intelligence with Responsibility (AIR). AIR aims to create an interdisciplinary network and frameworks that can indicate problems in ICT/AI/robotics research and prevent problems from

being overlooked [20]. AIR was established in 2014 to analyze a dispute that occurred when a journal cover design evoked gender-related controversy with a drawing of a stereotypical female android. The public criticized the cover design as it represented and reproduced a "division of sex role[s]" [21]. Since then, AIR has been discussing potential benefits and risks of ICT/AI/robotics by conducting a stakeholder opinion survey to discuss the future of human–machine relations [22], investigating the rising concern about robots replacing human jobs by visiting fields that are introducing AI/robotics at work places [23], and discussing the creation of a prototype system that, to some extent, automatically produces feedback to encourage rational dialog that might raise controversial opinions [20]. This fan fiction case was also used as an agenda item for discussion to help researchers increase awareness of different values. We commenced online discussions after Day 1.

B. Legally Unproblematic But Ethically Problematic

The AIR group's online discussion of this case was chaotic in the early days, covering a mixture of legal, ethical, and other issues. First, we discussed whether this research was cited or reprinted from the viewpoint of copyright law. Reprinting is not permitted according to the terms of Site Z (Site Z expressed on Twitter that it views this paper as a reprint). However, Japanese legislation permits quoting the original, and if the original is not indicated, there is a danger of plagiarism. From the legal point of view, we concluded that there were no legal problems with the author's presentation of the original text.

However, our interdisciplinary group discussion discovered that the ethical and moral standards and policies of research differ for each discipline, and that the obligation to present the source of the data and to protect the information provider to maintain the fairness of the research provider differ depending on the field. An AIR engineer emphasized that the information regarding the source data, including the source, needs to be made traceable in order to guarantee the authenticity of data and the reproducibility of the research. The AIR engineer involved in the operation of Society X noted that it is important to specify the reference to source (e.g., data, website, name of creators), as the academic society is also a place of education that can teach students how to conduct research.

In the field of humanities research, the case indicates that research ethics need to be revised to place more emphasis on protecting the interests of users. An AIR literary researcher noted that it is important to consider the circumstances in which the research outcome affects the study subjects and poses psychological distress to them. The researcher also noted that academic researchers, who appear to have significant authority, should have carefully approached the subject of the research given that fan

fiction writers make up a vulnerable community with a weak legal position.

As a related factor, the problem of "representation of culture" in anthropology was cited [24]. In anthropological studies, the problem of anthropologists deliberately increasing the value of cultures of their preference over local cultures has arisen. In anthropology studies conducted from the 1980s to the 1990s, researchers were criticized for this problem, and as a result, research is no longer conducted in some fields. Therefore, anthropologists have formulated a policy to minimize the influence of intervention—for example, as a rule, the name of the author and title of the work are generally pseudonyms.

Additionally, we found that Site Z requires users to register before browsing the contents. On Site Z, content intended for adults is access controlled to prevent access by minors. However, an AIR information ethics researcher noted that access control by age only hinders data usage for minors and does not prevent other adults from browsing the content. Thus, to clear up content usage questions, Site Z should include some clear description on its site noting that it is not possible to use data without an author's permission.

Several other precise discussions were held on fan fiction culture and the policies of Site Z; however, this paper did not aim to prescribe guidelines for a specific culture or site. Instead, we analyzed this case in the context of machine ethic issues related to privacy, property, and power [25].

C. Evaluation of Harm by Machines

The discussed research paper intended to detect obscene expressions in order to eliminate information that might be "harmful" to young people by filtering the text. The paper was written as a graduation thesis by undergraduate students. Therefore, multiple researchers raised the criticism that the quality and form of the paper was also problematic. In this paper, ten pieces of fan fiction were analyzed manually, not automatically, based on ranking. Additionally, determination of an expression as obscene depended on the authors' discretion, and the absence of objectivity was considered a problem.

However, various arguments related to machine ethics can be considered when focusing on purpose rather than quality of research. For example, an AIR philosophy of technology researcher questioned whether it is morally permissible to leave the "harmful judgement" to the machines. This raises the question of whether machines can make ethical judgments and act as explicit ethical agents [26]. In this case, "harmful" refers to information and expressions that pose psychological stress to young people, however there has been considerable discussion regarding physical harm such as the emergence of lethal autonomous weapons systems (LAWSs) [27].

Additionally, other AIR engineering researchers have set an agenda on how to solve this problem technologically

by achieving the research purpose while protecting the privacy of the community. If the authors had anonymized the information when quoting it, such an incident would not have occurred. Therefore, it is easy to say that the authors were careless and lacked consideration for their subject community. However, one of the AIR engineering researchers insisted that this should not be perceived as an individual problem but rather as a systematic problem. In other words, if this case had not been exposed to the public, the targeted fan fiction community writers would never have known that their texts were 1) labeled as "harmful" and 2) used as training data set. As a hypothetical scenario, if the algorithm of the discussed research paper is effective enough to be adopted as a police filtering classifier, then the fan fiction community writers' text will be featured more prominently. Classifying based on use as training data poses ethical and legal issues [28].

D. AI Governance

In addition, this case also challenges copyright law for obtaining data sets for machine learning. Currently, creating and analyzing training data based on online content is not considered copyright infringement under Article 47-7 "Reproduction, etc. for data analysis," including cases for commercial purposes, of the Copyright Law. Therefore, UGC is used as training data to promote R&D of artificial intelligence including deep learning. This is considered an advantageous law that promotes the use of machine learning in Japan. However, it is difficult to distribute trained data to the public [29]. Therefore, the need for system design that incorporates the copyright law and shared data sets will be discussed in the context of AI governance.

However, unlike the big information technology companies that have their own platforms to collect UGC data, most researchers have to use open data sets or must buy data from other companies. This is the circumstance that led to the case discussed in this paper that triggered the ethical controversy over issues of privacy, property, and power. The Secretariat of Intellectual Property Strategy Headquarters, Japanese Cabinet Office, is currently discussing revisions of the copyright law to correspond to the needs of the new era and to create data sets for machine learning to protect privacy and promote the creation of artificial intelligence in Japan [30].

E. Lessons From the Case: Changes to the Guidelines

As stated, AI governance, academic societies, and ethical education systems must also learn from this case. An AIR literature researcher was of the opinion that papers should undergo peer review beforehand to prevent similar instances from occurring again; however, it was noted by science and engineering researchers that the National Convention, which is a domestic academic meeting, has no peer-review process and that it is difficult to conduct peer reviews from a resource standpoint. An AIR sociologist also noted that an ethical review of such social surveys is difficult for research organizations such as universities and academic societies. Conferences are generally organized by volunteers who lack access to abundant resources, which would make it difficult to change their peer-review system.

Societies, however, could change their manuscript submission guidelines. For example, a Japanese computer science society changed its manuscript submission guidelines to emphasize that an author should indicate the source of the published contents when quoting and that the quote should be used only for the purposes permitted by the right holder and should be exactly within the legitimate range for the purpose of quotation. Referring to this guideline, some AIR members—triggered by the awareness of Society X to discuss their manuscript submission guidelines—changed not only the guidelines of the conference paper but also their journal submission guidelines. In addition, creating ethical guidelines and educating researchers and students were also topics of discussion by the AIR group. Similar cases could occur in the future when artificial intelligence researchers seeking data sets unconsciously infringe upon a right of a vulnerable community with a weak legal position. This paper is also intended for use as an educational resource.

V. CONCLUSION

This study analyzes the value conflict of a paper on fan fiction that attempted to extract and filter sexual expressions using online fan fiction novels as a source. Researchers from the fields of both engineering and humanities discussed the violations that occurred in this case and, as mentioned in the Discussion, this case should not be considered as a mere instance of researchers lacking considerations for the targeted community but rather as one that raises the following moral questions: whether the purpose of the research was ethically acceptable; whether machines could be explicit ethical agents and help avoid unethical outcomes; how the systems can be embedded in ethical values; how to treat online content to create and analyze training data under the current Copyright Law; how to consider AI governance by interdisciplinary collaboration when a person's value conflicts with the other person's value; and how to glean educational lessons for AI governance.

Our analysis aimed not only to clarify the abstract concept of privacy but also to make changes to Society X's submission guidelines for authors. This analysis also implies that machine ethics and AI governance are a continuum of traditional computer ethics and, more widely, of research ethics. Though the historical, cultural, and institutional contexts in other countries differ from Japan's, we believe that similar technological, social, and educational issues are discussed in many places, and we hope that our analysis contributes to the governance of ethical AIs and AI ethics on handling sensitive aspects of online activities. ∎

REFERENCES

[1] *The IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems, Ethically Aligned Design Version 2*, Standard, 2017.

[2] *The Conference toward AI Network Society*, Standard, Draft AI R&D Guidelines for International Discussions, 2017.

[3] "Annex2: G7 Multistakeholder exchange on human centric AI for our societies," Tech. Rep. G7 2017 Italia, 2017.

[4] *The Japanese Society for Artificial Intelligence Ethics Committee, About The Japanese Society for Artificial Intelligence Ethical Guidelines*, document, 2017.

[5] L. Palen and P. Dourish, "Unpacking 'privacy' for a networked world," in *Proc. SIGCHI Conf. Hum. Factors Comput. Syst. (CHI)*, New York, NY, USA, 2003, pp. 129–136.

[6] M. McLelland, "The world of Yaoi: The Internet, censorship and the global 'Boys' Love' Fandom," *Austral. Feminist Law J.*, vol. 23, no. 1, pp. 61–77, 2005.

[7] N. Noppe, "Social networking services as platforms for transcultural fannish interactions: Deviant ART and Pixiv," in *Manga's Cultural Crossroads*, J. Berndt and B. Kuemmerling-Meibauer, Eds. Abingdon, U.K.: Routledge, 2013, pp. 143–162.

[8] S. Ikemura, "Some topics relating to 'secondary creation' and 'Copyright,'" (in Japanese), *Kyojo Hougaku, Kyojo J. Politics*, vol. 11, pp. 19–33, 2017.

[9] M. Hamasaki and H. Takeda, "Social networks of an emergent massively collaborative creation community: Case study of Hatune Miku movie on Nico Nico Douga," in *Proc. CEUR Workshop*, 2009.

[10] M. McLelland, "The World of Yaoi: The Internet, Censorship and the Global 'Boys' Love' fandom," *Austral. Feminist Law J.*, vol. 23, no. 1, pp. 61–77, 2005.

[11] M. McLelland, "Regulation of Manga Content in Japan,"What is the Future for BL," in *Boys Love Manga and Beyond: History, Culture, and Community in Japan*, M. McLelland, K. Nagaike, K. Suganuma, and J. Welker, Eds. Jackson, MS, USA: University Press of Mississippi, 2015.

[12] T. D. Nguyen and E. J. Jung, "Privacy-preserving discovery of topic-based events from social sensor signals: An experimental study on Twitter," *Sci. World J.*, vol. 2014, Apr. 2014, Art. no. 204785.

[13] V. Vasudevan, J. Wickramasuriya, S. Zhao, and L. Zhong, "Is Twitter a good enough social sensor for sports TV?" in *Proc. IEEE Int. Conf. Pervasive Comput. Commun. Workshops (PerCom)*, Mar. 2013, pp. 181–186.

[14] D. J. Solove, "Speech, privacy, and reputation on the Internet," in *The Offensive Internet: Speech, Privacy, and Reputation*. 2010.

[15] R. Gross, A. Acquisti, and H. John Heinz, "Information revelation and privacy in online social networks," In *Proc. ACM Workshop Privacy Electron. Soc. (WPES)*, vol. 71, 2005, pp. 71–80.

[16] M. Zimmer, "But the data is already public': On the ethics of research in Facebook," *Ethics Inf. Technol.*, vol. 12, no. 4, pp. 313–325, 2010.

[17] D. Elgesem, "What is special about the ethical issues in online research?" *Ethics Inf. Technol.*, vol. 4, no. 3, pp. 195–203, 2002.

[18] A. Markham and E. Buchanan (2012). *Ethical Decision-Making and Internet Research: Version 2.0. Recommendations From the AoIR Ethics Working Committee*. [Online]. Available: https://aoir.org/reports/ethic2.pdf

[19] TWC. (2017). *Transformative Works and Cultures: Submissions*.

[20] A. Ema *et al.*, "Breaking down silos: Involving various researchers for driving HCI research," in *Proc. CHI Conf. Extended Abstract. Hum. Factors Comput. Syst. (CHI EA)*, New York, NY, USA, 2017, pp. 837–847.

[21] A. Ema, H. Osawa, H. Hattori, and N. Akiya, "Ethics and social responsibility: Case study of a journal cover design under fire," in *Proc. 33rd Annu. ACM Conf. Extended Abstract. Hum. Factors Comput. Syst. (CHI EA)*, New York, NY, USA, 2015, pp. 935–940.

[22] A. Ema *et al.*, "Future relations between humans and artificial intelligence: A stakeholder opinion survey in Japan," *IEEE Technol. Soc. Mag.*, vol. 35, no. 4, pp. 68–75, Dec. 2016.

[23] H. Osawa *et al.*, "What is real risk and benefit on work with robots?: From the analysis of a robot hotel," *Proc. Companion ACM/IEEE Int. Conf. Human-Robot Interact. (HRI)*, New York, NY, USA, 2017, pp. 241–242.

[24] J. Clifford and E. M. George, *Writing Culture: The Poetics and Politics of Ethnography*. Berkeley, CA, USA: Univ. California Press, 1986.

[25] A. D. Moor, *Information Ethics: Privacy, Property, and Power*. Seattle, WA, USA: Univ. Washington Press, 2005.

[26] J. H. Moor, "The nature, importance, and difficulty of machine ethics," *IEEE Intell. Syst.*, vol. 21, no. 4, pp. 18–21, Jul. 2006.

[27] A. Gerdes, "Ethical issues concerning lethal autonomous robots in warfare," in *Sociable Robots Future Social Relations: Proceeding Robo-Philosophy*, J. Seibt, R. Hakli, M. Nørskov, Eds. Amsterdam, The Netherlands: IOS Press, 2014, pp. 277–289.

[28] B. D. Mittelstadt, P. Allo, M. Taddeo, S. Wachter, and L. Floridi, "The ethics of algorithms: Mapping the debate," *Big Data Soc.*, vol. 3, no. 2, pp. 1–21, 2016.

[29] H. Nakashima, Ed. "*Artificial intelligence white paper*," Kadokawa (in Japanese), Information-technology Promotion Agency, Japan, White Paper, 2017.

[30] "The secretariat of intellectual property strategy headquarters," Jpn. Cabinet Office, Tech. Rep., 2017.

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