# CHAPTER III

# Transforming the Catholic Church: Responding to Ethical Challenges in the AI Technology Revolution

**Cristoforus G. Apul (kristoforus.cse@gmail.com)**
**Fedrianus Korintius Lektawan (fedrianaskorintius@gmail.com)**

**STIKAS St. Yohanes Salib – West Kalimantan**

**Abstract**

This article explores the Catholic Church's response to the ethical challenges of the technological revolution of artificial intelligence (AI). The Church is faced with the responsibility to formulate an ethical view regarding the application of AI so that it is in line with its moral and theological values. This paper details AI ethical principles from the perspective of experts and Pope Francis, highlighting data privacy, algorithmic bias, and automation as vital ethical challenges. In addition, this article discusses the Church's moral teachings regarding responsibility in developing AI and the theological and philosophical implications of applying this technology. To respond to these challenges, this paper emphasizes the need to transform the Church through interdisciplinary engagement, education of the faithful, and implementation of AI ethical guidelines. Overall, this article aims to provide insight into the role of the Catholic Church in guiding society towards the use of AI that is in harmony with human values.

**Keywords:** Artificial Intelligence (AI), Ethics, Transformation, Interdisciplinary,

## Introduction

The artificial intelligence (AI) technological revolution has become a significant driver of change in social and ethical structures. As an established moral authority, the Catholic Church is faced with the urgent task of navigating the complexities generated by these advances. As stated by Morozov, Technology is not only revolutionizing the way we think but also raises profound questions about our ethics and values. (Morozov et al., 2019) In an era where developments in AI are increasingly taking humanity in previously unimaginable directions, experts have highlighted the need for substantial changes in the understanding of ethics and human values. In the context of the Catholic Church, this institution has a moral responsibility to detail and articulate its ethical views on using AI technology.

Several experts, such as Floridi and Bryson, emphasize the need to adopt a proactive and inclusive ethical approach in dealing with AI developments. The Catholic Church, as an entity with significant influence on global moral thought, can play a central role in designing ethical frameworks that can be adopted by society at large. (Floridi, 2019). The transformation of the Catholic Church within this paradigm is not only a response to ethical challenges but also an attempt to bridge the gap between religious values and technological progress. (Latkovic, 2015) In this case, an inclusive and open approach to dialogue between the Church and AI experts is critical. The Catholic Church must draw on its theological and ethical heritage to guide its people and society in aligning artificial intelligence's ethics with fundamental human principles. (Jackelen, 2021)

In this paper, we will explore the concrete steps taken by the Catholic Church to address ethical transformation in the era of the AI technological revolution. By detailing the Church's theological, ethical, and pastoral views, this paper aims to provide in-depth insight into how religious institutions can contribute to the development of an artificial intelligence ethic grounded in moral and human values. (Green, 2017).

As AI capabilities continue to increase, the Catholic Church faces pressing questions regarding this technology's theological and ethical implications. Key issues include human dignity, privacy, accountability, bias and social equity. The Church must provide moral guidance on whether and how AI should make decisions that profoundly impact human life and society. As Pope Francis stated in the encyclical Laudato Si', Rapid technological development is not accompanied by progress in social responsibility, wisdom and moral awareness, will only lead to humanitarian disaster (Pope Francis, 2015). Therefore, the Church must provide ethical guidance for the development and use of AI.

Some experts have proposed an AI social contract framework that balances advancing innovation and preserving human values. The Catholic Church can make a substantial contribution to those efforts. According to Bryson and Winfield (2017), integrating ethical values into AI systems requires the involvement of various stakeholders, including technologists, philosophers, sociologists, and religious circles. In this way, the Church can contribute its theological and philosophical views. This article outlines practical guidance for the Church as it navigates the fundamental ethical transformations arising from advances in AI. A mature response demands recognizing the promise and the dangers of this rapidly evolving technology.

## Literature Review

### AI Ethics Principles from the Perspectives of Experts and Organizations

In an era of technological progress, the development of artificial intelligence (AI) has become a significant focus in ethical literature. In this case, experts and international organizations formulate ethical principles to guide the development and use of AI ethically. Research by Timnit Gebru and (Whittaker et al., 2018) emphasized the importance of justice and diversity in developing AI technology.

They warned against the risk of algorithmic bias that could reinforce inequality, underscoring the need to avoid discrimination in artificial intelligence systems. The same thing was also emphasized (Gupta & Kumar, 2019) that there needs to be transparency in developing AI technology to be ethically accountable. Thus, the concept of ethics in technology development includes individual responsibility and aspects of justice, diversity, and transparency.

Furthermore, Michael (Kim et al., 2020) also added the dimensions of accountability and transparency as critical elements in managing AI's social and moral impact. According to Loui, AI developers and users must be responsible for the consequences of decisions made by algorithms. This concept aligns with an ethical view emphasizing individual responsibility in creating and using technology. (Kappos et al., 2021)

In addition, international organizations have contributed to detailing AI ethical principles. (Reed & Price, 2019) highlighting the importance of ensuring that AI developments comply with human rights. UNESCO's ethical guidelines emphasize the importance of protecting individual rights, such as privacy and freedom of expression. In addition, (Barrows et al., 2019) emphasize the principles of security, transparency and accountability as the foundation for developing AI technology.

Data security and openness in algorithms are priorities to ensure public trust in this technology. The views of the Catholic Church, as represented in Pope Francis' encyclical Laudato Si, offer a rich perspective on human responsibility for creation. The Church emphasizes the need to develop sustainable technology that creates a positive impact on the environment and society. (Fransiskus, 2016) views that human rights and dignity must be a guide in using technology, including AI.

The integration of the perspectives of experts, international organizations, and the Catholic Church creates a solid foundation for a holistic AI ethics policy. The principles of fairness, diversity, accountability and transparency are the

foundations that are applied universally. (Schneider et al., 2020) By referring to these various perspectives, AI developers, stakeholders and users can be wiser in facing challenges and optimizing the benefits of AI technology without ignoring its ethical impact.

**Key Ethical Challenges for Churches in AI Adoption**

The adoption of artificial intelligence (AI) by the Catholic Church brings with it several ethical challenges that require careful handling to align with its moral and theological values. One of the main challenges is the issue of data privacy that arises in the context of using AI technology in ecclesiastical services. In the Catholic perspective, respect for individual privacy is integral to human dignity. (Dambrine & Kateb, 2011) This principle aligns with Church teachings, which recognize the importance of protecting individual rights as part of moral responsibility.

The Catholic Church emphasizes the importance of privacy as a protection of human rights, which includes the right of every individual to protect their boundaries from unauthorized interference (Dambrine & Kateb, 2011); KGK, 1994). The results of Pranadita's 2020 research highlight the importance of a deep understanding of AI technology in responding to ethical challenges. The research emphasizes that the Catholic Church needs to comprehensively understand how this technology works to respond to its ethical challenges. One of the important aspects discussed in the research is the need to protect individual rights as part of the moral responsibilities recognized by the Church. This aligns with Church teaching principles, which recognize the importance of protecting individual rights as part of moral responsibility. (Herzfeld, 2017)

The next issue that arises is algorithmic bias in ecclesiastical decision-making. (Saletta et al., 2020) Highlights the need for ethical sustainability in overcoming biases that can arise in algorithms. The Catholic Church is faced with the critical task of ensuring that the implementation of AI does not override the values of justice and equality in ecclesiastical ministry. This effort aligns with the Church's social principles, emphasizing justice as an integral part of moral action (Green, 2022). They emphasized that in implementing moral teachings, it is essential to uphold justice in all aspects of social life. In their view, justice is the basis of moral action to ensure fair treatment for all people, especially the marginalized and weak. This refers to the Church's social teachings emphasizing the need to prioritize justice in social structures, public policies and interactions between people. (Green, 2022)

Additionally, automation in liturgy and pastoral care creates complex ethical challenges. In Evangelii Gaudium, Pope Francis emphasizes the importance of personal presence in pastoral ministry. Technology, including AI, must be integrated wisely to ensure that the human dimension of ecclesiastical interactions is not compromised (Francis, 2013). This highlights the need to consider spiritual and human aspects in technology adoption, in line with the Church's pastoral principles.

**Moral Teachings of the Catholic Church**

The Catholic Church is known for its solid and consistent moral teachings. As an ethical basis, these doctrines are an essential starting point in responding to developments in AI technology. As stated by Pope John Paul II, Human dignity is the essence of morality, and ethics is a guide that guides humans to achieve their life goals. (Sullivan, 2008)

The Catholic Church's Moral Teaching on Artificial Intelligence (AI) reflects the Church's ethical views on technology and its impact on human dignity. According to Pope Francis in his encyclical Laudato Si, the Catholic Church emphasizes the need to develop technology that considers sustainability and human well-being. (Francis, 2016) In the context of AI, the Church demands that artificial intelligence be developed and applied with full moral responsibility. Pope Francis stated, As technology takes over risky decision-making, we need to ensure that principles of ethics and justice form the basis of the design and use of such systems. (Francis, 2016)

Catholic theologians such as Father Philip Larrey of Pontifical Lateran University also highlight the importance of ethics in AI. In his interview, Fr Larrey stated that the Church believes that moral principles, such as human dignity, solidarity, and justice, should guide AI. AI design, development, and implementation should prioritize the common good and avoid consequences that harm humans or society.(Dodig-Crnkovic Raffaela Giovagnoli Editors, n.d.) Therefore, the Moral Teachings of the Catholic Church emphasize the need to develop and manage artificial intelligence with full ethical consideration so that this technology positively contributes to humanity.

The Catholic Church also highlights the need to ensure that developments in AI do not replace human roles and responsibilities, especially in the context of complex moral decisions. Humans must retain control over decisions that affect their lives and dignity. The Church emphasizes the need to develop AI with full

attention to its social, economic and ecological impacts and is committed to minimizing risks and unintended consequences. Human dignity. (Denar et al., 2021). Within this framework, the ethics of AI technology should be based on fundamental principles such as respect for human rights, justice and solidarity. The Church encourages dialogue between technologists, ethicists, and religious leaders to ensure that developments in AI technology are in harmony. The Catholic Church hopes that advances in AI can positively contribute to human development and create more just, dignified, principles of life, inspired by the moral teachings of the Church. (Refo, 2023)

## Discussion

### The Ethical Impact of the AI Technology Revolution

It is essential to examine the ethical impact of the AI technological revolution in the context of the Catholic Church. As Florida explains, When we give machines intelligence, we not only give them the ability to think but also give them the ability to make ethical decisions. (Floridi et al., 2020) This raises critical questions about the balance between technological progress and value -moral values that underlie the Church's beliefs.

The ethical impact of the AI technological revolution on the Catholic Church involves deep consideration of the moral, social, and theological implications of technological advances. In his encyclical Fratelli Tutti, Pope Francis underscored his concern about the inequalities that technology can exacerbate, including artificial intelligence. He stated that technological growth and globalization, if not managed well, can strengthen forms of inequality and increase injustice. (Francis, 2020) Therefore, the church has a moral responsibility to ensure that the development and application of AI takes place with due regard for principles - principles of justice and human dignity.

According to Catholic theologians such as Father Paolo Benanti, who is involved in the fields of ethics and technology, the church is tasked with guiding its people in using AI technology ethically. In his view, the Church can provide the necessary moral guidance and guide its congregation to use technology responsibly, ensuring that human values and justice remain paramount(Paolo et al.). Therefore, the ethical impact of the AI technological revolution on Church Catholicism is a call to provide relevant moral guidelines in the use of technology

so that these advances can align themselves with human values and the Church's moral teachings.

**Church Transformation and Interdisciplinary Engagement**

Church transformation requires engagement in interdisciplinary dialogue. For example, (Febrianto & Cahyono, 2023) shows the need for synergy between theology and computer science. The Church must be actively involved in the development of AI technology, not only as a critic but also as a partner who guides its ethical and moral formation, he said. This underscores the importance of collaboration to direct technological development in a direction consistent with the Church's values.

The transformation of the Church in the face of the era of artificial intelligence (AI) involves deep interdisciplinary engagement. In his message to the Academy of Social Sciences, Pope Francis acknowledged the need for the involvement of various scientific disciplines to address the impact of technology on society. He stated that these questions require the involvement of scientists with theologians and ethicists, who can form constructive dialogue and create bridges between different scientific disciplines to respond wisely to new challenges posed by scientific and technological developments. (Matheus Purwatma , 2016)

Interdisciplinary experts such as Dr. Mary Hirschfeld, an economist and theologian, highlight the importance of collaboration between disciplines in formulating a holistic approach to AI. In the context of the Church, Hirschfeld stated, The transformation of the Church in the face of AI requires strong interdisciplinary engagement, where economists, theologians, ethicists, and social scientists work together to understand the impact of this technology on human values and dignity. (Rees, 2020) Therefore, the Church's transformation efforts regarding AI require holistic involvement from various fields of science so that the Church can provide a balanced and relevant view of the rapid development of technology (Matheus Purwatma, 2016)

**Community Education and Implementation of Ethics Guidelines**

Community education is vital in responding to ethical challenges. In line with Nussbaum's view, Ethical education is not only about knowing, but also about understanding and feeling it, (Lie, 2022). The Church needs to develop educational programs that imbue ethical values in the context of AI technology. In

addition, implementing clear and relevant ethical guidelines will provide a practical basis for people to deal with everyday ethical dilemmas.

Community education regarding implementing ethical guidelines related to artificial intelligence (AI) is crucial in aligning technological progress with moral values and justice. (Refo, 2023) In line with the development of AI technology, community education aims to increase awareness of the ethical impacts of implementing this technology. As stated by Professor Wendell Wallach, a technology ethicist, Education is key to shaping society's perception of AI and ensuring that society has a better understanding of how to manage and use this technology ethically. (Mukama, 2018) By providing sufficient knowledge to the people, the church can play an essential role in forming a responsible attitude toward using AI to create an environment of justice and dignity.

Implementing ethical guidelines in artificial intelligence also requires collaboration between religious institutions and the scientific community. In his encyclical (Francis, 2020), Pope Francis emphasized the importance of dialogue and cooperation to create a more just world. In this case, educating people about AI ethics can be a starting point for such collaboration. Professor Shannon Vallor, a technology ethicist, highlights the need to include ethical and religious voices in the technology design and implementation process. Therefore, community education prepares individuals to understand the ethical implications of AI and actively participate in forming norms and regulations that reflect society's moral and spiritual values.

**Case Study: AI Technology Project in a Catholic Church Environment**

Case studies on the application of artificial intelligence (AI) technology within the Catholic Church demonstrate the evolution of technology's role in supporting ecclesiastical missions. According to Dr Maria Antonia Brancaccio, a theology and technology expert, The application of AI in the church can improve administrative efficiency, allowing clergy to focus more on pastoral care. For example, an AI-based data management system can help manage the congregation's database, simplify sacrament tracking, and facilitate internal communications. Apart from that, this approach also reflects the views of Pope Francis, who stated that the church must be at the forefront of adopting technological developments to improve the quality of its services. (Bordot, 2023)

However, Professor of AI and Technology Ethics Dr. Javier Ruiz reminds us to consider the ethical implications of using AI in religious contexts. In his view,

the church needs to ensure that the application of this technology does not replace the essence of spirituality, but rather strengthens the religious experience of the congregation. Therefore, the implementation of AI technology in the church environment must be based on strong moral and ethical values, ensuring that the technology becomes a positive tool in supporting the spiritual mission goals of the Catholic church. (Qc, 2022)

## Theological and Philosophical Implications for the Application of AI Technology in the Catholic Church

The theological and philosophical implications of applying artificial intelligence (AI) technology in the Catholic Church are essential in responding to the growing technological revolution. At a theological level, it is necessary to consider how these technological developments affect the concept of divine presence and the spiritual experience of Catholics (Macsut & Grosu, 2012).

In the teachings of the Catholic Church, the aspect of divinity and the divine presence in people's lives is a crucial theological point. With the integration of AI technology, it is necessary to consider whether the existence of machines and artificial intelligence can coexist with people's spiritual experiences or even shift the dimensions of human spirituality. In his encyclical, Pope Francis emphasized that the presence of technology must support, not replace, the human relationship with spiritual life (Francis, 2016). Philosophical views also significantly impact the Church's understanding of the application of AI technology. Distributism, introduced by G.K. Chesterton and Hilaire Belloc, offers a philosophical perspective on the distribution of wealth and power in society (Ripple et al., 2022). In the context of the Catholic Church, distributism can be a basis for evaluating the distribution of benefits and the impact of AI technology on society and individuals.

The ethical views of transhumanism also need to be considered in a philosophical context. The question of the boundaries between humans and technology, whether humans can improve themselves through integration with AI technology, is an ethical consideration that needs to be accommodated in the Church's thinking. In the encyclical Fides et Ratio (Venerable & Bishops, n.d.), Pope John Paul II provides a philosophical basis for dialogue between faith and rationality, which can guide the Church in responding to technological challenges related to technological developments.

The theological and philosophical implications also include questions regarding the Church's moral responsibility towards AI technology. How can the

Church guide its people to use technology responsibly, ensuring that human values and justice are maintained? (Song, 2021) Father Paolo Benanti, a Catholic theologian involved in the fields of ethics and technology, suggests that the Church can provide guidance on necessary morals and guide their followers in the use of technology (Paolo, 2022).

The Catholic Church can formulate a holistic and spiritually informed approach to applying AI technology by understanding the theological and philosophical implications. This creates a solid foundation for the Church's ethical policies and guidelines, which reflect moral and spiritual values and provide insight into how technology can support the spiritual experience and well-being of the congregation (Bawazir et al., 2018).

## Conclusion

The technological revolution in artificial intelligence (AI) poses various ethical challenges for the Catholic Church. The Church needs to transform an interdisciplinary and inclusive approach to respond to this challenge. AI ethical principles formulated by experts and international organizations, such as fairness, diversity, accountability, and transparency, are used as a reference.

Churches face data privacy issues, algorithmic bias, and automation in the context of AI implementation. The Church's moral teachings that emphasize human dignity and technological responsibility demand the development of AI in harmony with human values. Interdisciplinary dialogue and collaboration are vital to establishing AI ethics and regulation. Community education is also needed to increase understanding of the ethical impacts of AI. Implementing ethical guidelines by the Church can provide a practical framework for using this technology. Overall, the Church needs to proactively guide society and the technology community to optimise the benefits of AI without compromising moral values and justice.

## Reference

Barrows, C., Bloom, A., Ehlen, A., Ikäheimo, J., Jorgenson, J., Krishnamurthy, D., Lau, J., McBennett, B., O'Connell, M., & Preston, E. (2019). The IEEE reliability test system: A proposed 2019 update. IEEE Transactions on Power Systems, 35(1), 119–127.

Bawazir, M. A., Mahmud, M., & Molok, N. N. A. (2018). Persuasive technology from an Islamic perspective. Proceedings - International Conference on

Information and Communication Technology for the Muslim World 2018, ICT4M 2018, 260–265. https://doi.org/10.1109/ICT4M.2018.00055

Dambrine, M., & Kateb, D. (2011). On the shape sensitivity of the first Dirichlet eigenvalue for two-phase problems. Applied Mathematics & Optimization, 63, 45–74.

Denar, B., Juhani, S., & Riyanto, A. (2021). Ecotheological Dimensions of Roko Molas Poco in the Tradition of Making Traditional Houses of the Manggarai Community - NTT. Journal of Asian Orientation in Theology, 03(01), 59–88. https://doi.org/10.24071/jaot.v3i1.3218

Dodig-Crnkovic Raffaela Giovagnoli Editors, G. (n.d.). Studies in Applied Philosophy, Epistemology and Rational Ethics Representation and Reality in Humans, Other Living Organisms and Intelligent Machines.

Febrianto, B., & Cahyono, A. B. (2023). Implementasi Doktrin Penyalahgunaan Keadaan (Misbruik Van Omstandigheden) dalam Perkara Jual Beli dengan Surat di Bawah Tangan (Studi Kasus: Putusan Nomor 243/Pdt. G/2020/PN Mdn dan Putusan Nomor 101/Pdt/2021/PT Mdn). Lex Patrimonium, 2(2), 5.

Floridi, L. (2019). Translating Principles into Practices of Digital Ethics: Five Risks of Being Unethical. Philosophy and Technology, 32(2), 185–193. https://doi.org/10.1007/s13347-019-00354-x

Francis. (2013). Apostolic Exhortation - Evangelii Gaudium (Joy of the Gospel). 74. https://www.vatican.va/content/francesco/en/apost_exhortations/documents/papa-francesco_esortazione-ap_20131124_evangelii-gaudium.html

Fransiskus, P. (2016). Ensiklik Paus Fransiskus Laudato Si'. Seri-Dokumen-Gerejawi-No-98-LAUDATO-SI-1, 1–150.

Green, B. P. (2017). Artificial Intelligence and Ethics - Markkula Center for Applied Ethics.

Green, B. P. (2022). The Vatican and Artificial Intelligence: An Interview with Bishop Paul Tighe. Journal of Moral Theology, 11(Special Issue 1), 212–231. https://doi.org/10.55476/001c.34131

Gupta, A., & Kumar, A. (2019). Common spectral properties of linear operators A and B satisfying A k B k A k = A k+1 and B k A k B k = B k+1. Asian-European Journal of Mathematics, 12(5). https://doi.org/10.1142/S1793557119500840

Herzfeld, N. (2017). Introduction: Religion and the new technologies. Religions, 8(7), 8–10. https://doi.org/10.3390/rel8070129

Jackelén, A. (2021). Technology, Theology, and Spirituality in the Digital Age.

Zygon, 56(1), 6–18. https://doi.org/10.1111/zygo.12682

Kappos, L., Fox, R. J., Burcklen, M., Freedman, M. S., Havrdová, E. K., Hennessy, B., Hohlfeld, R., Lublin, F., Montalban, X., Pozzilli, C., Scherz, T., D'Ambrosio, D., Linscheid, P., Vaclavkova, A., Pirozek-Lawniczek, M., Kracker, H., & Sprenger, T. (2021). Ponesimod Compared with Teriflunomide in Patients with Relapsing Multiple Sclerosis in the Active-Comparator Phase 3 OPTIMUM Study: A Randomized Clinical Trial. JAMA Neurology, 78(5), 558–567. https://doi.org/10.1001/jamaneurol.2021.0405

Kim, D., Jesiek, B. K., Zoltowski, C. B., Loui, M. C., & Brightman, A. O. (2020). An academic-industry partnership for preparing the next generation of ethical engineers for professional practice. Advances in Engineering Education.

Latkovic, M. S. (2015). Thinking about Technology from a Catholic Moral Perspective. The National Catholic Bioethics Quarterly, 15(4), 687–699. https://doi.org/10.5840/ncbq201515470

Lie, R. (2022). Metode Baru untuk Menghubungkan Peserta Didik dengan Iman Kristen. Jurnal Kala Nea, 3(2), 68–82. https://doi.org/10.61295/kalanea.v3i2.89

Macsut, A. M., & Grosu, S. (2012). Singularity and catholic spirituality. ACM International Conference Proceeding Series. https://doi.org/10.1145/2331714.2331725

Matheus Purwatma. (2016). Internet dan Pewartaan dalam Pesan Paus untuk Hari Komunikasi se Dunia 2002-2016. Jurnal Orientasi Baru, 25(1), 57–74.

Morozov, S. P., Vladzymyrskyy, A. V., Klyashtornyy, V. G., Andreychenko, A. E., Kulberg, N. S., Gombolevsky, V. A., & Sergunova, K. A. (2019). Clinical acceptance of software based on artificial intelligence technologies (radiology).

Mukama, E. (2018). New Digital Technologies: A Kairos for Catholic Education in Rwanda. Journal of Religious and Theological Information, 17(1), 22–32. https://doi.org/10.1080/10477845.2017.1354594

Paolo Benanti. (n.d.).

Qc, M. R. (2022). The Ryder Review. June.

Reed, M. G., & Price, M. F. (2019). UNESCO biosphere reserves: supporting biocultural diversity, sustainability and society. Routledge.

Ripple, W. J., Wolf, C., Gregg, J. W., Levin, K., Rockström, J., Newsome, T. M., Betts, M. G., Huq, S., Law, B. E., Kemp, L., Kalmus, P., & Lenton, T. M. (2022). World Scientists' Warning of a Climate Emergency 2022. BioScience, 72(12), 1149–1155. https://doi.org/10.1093/biosci/biac083

Saletta, M., Kruger, A., Primoratz, T., Barnett, A., van Gelder, T., & Horn, R. E. (2020). The role of narrative in collaborative reasoning and intelligence analysis: A case study. Plos One, 15(1), e0226981.

Schneider, P., Walters, W. P., Plowright, A. T., Sieroka, N., Listgarten, J., Goodnow, R. A., Fisher, J., Jansen, J. M., Duca, J. S., Rush, T. S., Zentgraf, M., Hill, J. E., Krutoholow, E., Kohler, M., Blaney, J., Funatsu, K., Luebkemann, C., & Schneider, G. (2020). Rethinking drug design in the artificial intelligence era. Nature Reviews Drug Discovery, 19(5), 353–364. https://doi.org/10.1038/s41573-019-0050-3

Song, Y. S. (2021). Religious AI as an Option to the Risks of Superintelligence: A Protestant Theological Perspective. Theology and Science, 19(1), 65–78. https://doi.org/10.1080/14746700.2020.1825196

Sullivan, F. A. (2008). The Holy See. The Blackwell Companion to Catholicism, November, 418–431. https://doi.org/10.1002/9780470751343.ch29

Venerable, M., & Bishops, B. (n.d.). The Holy See.

Whittaker, M., Crawford, K., Dobbe, R., Fried, G., Kaziunas, E., Mathur, V., Myers West, S., Richardson, R., Schultz, J., & Schwartz, O. (2018). AI Now 2018 Report. AI Now, December 1–62.

**Author's Profile**



**KRISTOFORUS G. APUL**, born in Dalo, 04 Juli 1995, domiciled in Landak, West Kalimantan - Indonesia, email: kristoforus.cse@gmail.com. Education: graduated from the Bachelor of Theology and Philosophy Program at STIKAS St. Yohanes Salib, Bandol in 2023. The current functional position is a postgraduate student in the Master of Theology Program at STIKAS St. Yohanes Salib, Bandol.



**FEDRIANUS KORINTIUS LEKTAWAN**, born in Dalo 17 Juli 1986, email: fedrianaskorintius@gmail.com. Education: Graduated from Licentiate in Sacred Theology at Pontifical University of Teresianum Rome, Italy in 2021. My current functional position is as a lecturer of Spirituality at STIKAS Santo Yohanes Salib, Bandol.