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An Overview of the AI Ecosystem from the Perspective of Information Philosophy: Ethical Issues and Solutions

Bilişim Felsefesi Perspektifinden Yapay Zekâ Ekosistemine Bakış: Etik Sorunlar ve Çözüm Arayışları

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Abstract: Cybernetics and information science deeply change our traditional social, political and philosophical experiences and shape them with new ways and methods. With reference to the concept of atmosphere described by geographical science, artificial intelligence ecosystem models and the infosphere created by information technologies are new activity areas of our age. Today's people, who have entered the influence of the pragmatic comfort zone with the information revolution and who carry out their intellectual and economic actions through smart systems, have had to face ethical problems in the face of the new-old dilemma. Indeed, innovative artificial intelligence-based applications are preferred instead of traditional human-oriented applications in daily and corporate works. In the development of artificial intelligence and its ecosystem, the focus is on pragmatic benefit rather than the value area belonging to humans. This attitude often causes ethical values to remain in the background while developing the goals of artificial intelligence technologies. The study deals with the ethical problems in artificial intelligence and its ecosystem and the artificial intelligence ecosystem model that preserves the ethical development of humans. Additionally, a human-centered AI ecosystem model is proposed that argues its applicability to AI ethical policies.

Keywords: Artificial intelligence, artificial intelligence ecosystem, the philosophy of information, information ethics, ethics.

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1.Introduction

Our era is changing and transforming rapidly and in a dimensional manner, unlike previous periods, with the developments in information technologies. The source of this change and transformation is the actors of the information revolution. Artificial intelligence (AI), which constitutes today's rapidly developing technological environment, is transforming the way we live and work in a way we have never experienced before by reshaping industries as well as cultural acquisitions. Artificial intelligence, which is a simulation of human activities such as understanding, interpreting, producing solutions and making decisions, is increasingly taking an active role in every aspect of life by imitating human algorithmic acquisitions.

Artificial intelligence, which was initially the subject of speculative discussions, has now become used in almost every area of our lives, from health to finance, from education to the entertainment sector. It is used in the diagnosis of diseases in health, from the production of new types of drugs to the development of the right drug for diagnosed diseases, and in the fields of personalized treatment plans and robotic surgery, which also benefit from the patient's disease history. In the field of finance, artificial intelligence is used in fraud detection, credit scoring, algorithmic trading applications, and personalized financial activities to create new investment areas for individuals and companies. In the field of education, artificial intelligence is used to improve the student's learning experience and the educator's teaching experience, while in the field of transportation, it is used for innovative applications in areas such as traffic management and route optimization. Artificial intelligence, which stands out especially in the field of production and marketing, is at the focus of commercial activities aimed at quality control and increasing the efficiency of the supply chain according to geographical and cultural dimensions. In areas requiring human-machine interaction, artificial intelligence responds to customer demands with virtual assistants. It can help managers make decisions in making the right choice in recruiting and selecting qualified personnel in human resources. Artificial intelligence, the most popular tool in the new generation entertainment sector, is frequently used in developing users' motor or cognitive experiences, as well as creating personalized content

recommendation schemes for players thanks to its control system. In systems consisting of a decision network, it is possible to have information about the current state of the agent, its actions, the possible situation that will arise from the action of the agent, and the benefits and risks of this situation (Russell & Norvig, 1995, p.545).

Artificial intelligence technologies used in different fields can come together to create artificial intelligence ecosystems to increase productivity and innovation. Artificial intelligence ecosystems, which are especially preferred in education and production modeling, also bring ethical problems.

This study draws attention to the necessity of ethical policies in the ecosystems created by artificial intelligence technologies as well as the ethical principles that these ethical policies should center on. The Flourishing Ethics theory perspective is proposed as a solution to ethical problems in the artificial intelligence ecosystem. The adaptation of the theory developed by Turkish philosophy researcher Kantar and American philosopher Bynum to the artificial intelligence ecosystem is explained.

Artificial intelligence technologies can be studies in different application areas, and more than one artificial intelligence can create an ecosystem to achieve a specific purpose or to produce solutions to economic or social problems. As the size of data circulation increases, ethical problems can deepen and turn into a complex structure. In order to overcome these problems, it is necessary to develop policies and include metaethical perspectives in the solution field rather than determining singular ethical rules.

The study focuses on the adaptation of Flourishing ethical theory in the construction of the artificial intelligence ecosystem.

2. What is the Artificial Intelligence Ecosystem?

As in industrial revolutions, technological and scientific developments have the potential to change and transform new socio-cultural and economic activities. The information revolution has also brought new society and business models to our age. In fact, Luciano Floridi states that today's economic activities are based on information technologies. Adding intangible assets to this, Floridi states that information-intensive services depend on the role played by public sectors focused on information. He states that in the structure formed by information societies, instead of

agricultural and commercial product outputs, data is processed and included in the life cycle (Floridi, 2010, pp. 3-7).

Artificial intelligence ecosystems are models where institutions and companies with artificial intelligence and technological infrastructure share their knowledge, experience and experience with their members or stakeholders within the ecosystem.

The expected benefit in the artificial intelligence ecosystem is to provide the best optimization in the interests and expectations of the stakeholders within the ecosystem. It is aimed to increase the level of Digital Transformation brought by information technologies with artificial intelligence technologies and to develop institutional models within the ecosystem. With the ecosystem structure, gains such as growth in business volume, improvement in product variety and quality are expected in line with the economic and pragmatic expectations of the stakeholders within the system. Since the product and design development stages, which have digital and physical outputs, also include the aspect of human life that concerns the value areas, they bring about cybersecurity and ethical consequences.

Countries are making various breakthroughs to realize their development moves by processing big data with smart computational technologies such as artificial intelligence systems[1]. As a matter of fact, in a world where we are increasingly digitalised, the level of economic and industrial development will be shaped by efforts towards digital cooperation.

Artificial intelligence ecosystems can be used for models that cooperate towards similar goals, as well as models that enable the integration of knowledge and experience between different areas. They can be built in different areas, from smart industrial ecosystem models to agriculture, food and animal husbandry, finance and education.

Artificial intelligence can include different fields with its interdisciplinary structure. This allows artificial intelligence technologies to create an

[1] It is possible to show project calls such as the Scientific and Technological Research Council of Turkey (TUBITAK), the Technology and Innovation Support Programs Directorate (TEYDEB) Innovation Support Program 1711; Artificial Intelligence Ecosystem Call - 2024 as examples of these breakthroughs (*1711 - Artificial Intelligence Ecosystem Call | TÜBİTAK | Türkiye Bilimsel ve Teknolojik Araştırma Kurumu*,).

ecosystem where different fields or similar fields can cooperate and share their knowledge and experience. However, in order for this entire system to progress and develop correctly, valuable and sufficient parameters about the field in question must be systematically collected, stored and classified. Data that will contribute to optimization must be created from the right data sets. The quality and quantity of data is extremely important for the correct implementation of the ecosystem and the artificial intelligence models in the ecosystem.

The Artificial Intelligence ecosystem is one of the new community models of the information age in education and commercial activities. The result-oriented economic benefits of institutions and organizations that process data with artificial intelligence techniques are an indisputable success. It is possible to give examples of organizations operating worldwide in the fields of transportation, logistics support, and marketing through artificial agents, almost without human intervention, with artificial intelligence technology. Retailer, technology company, entertainment destinations, XYZ company, which carries out advertising and promotional activities with artificial intelligence applications and provides deliveries with its own aircraft fleet, is rapidly progressing towards creating the largest artificial intelligence ecosystem of the period and increasing its economic benefit value day by day. As shown in Figure 1, applications in different areas created with artificial intelligence show that the business segments of the ecosystem created by the companies also play a decisive role in the consumption of other types of products and services. In fact, the purpose of this designed system is to develop an ecosystem.

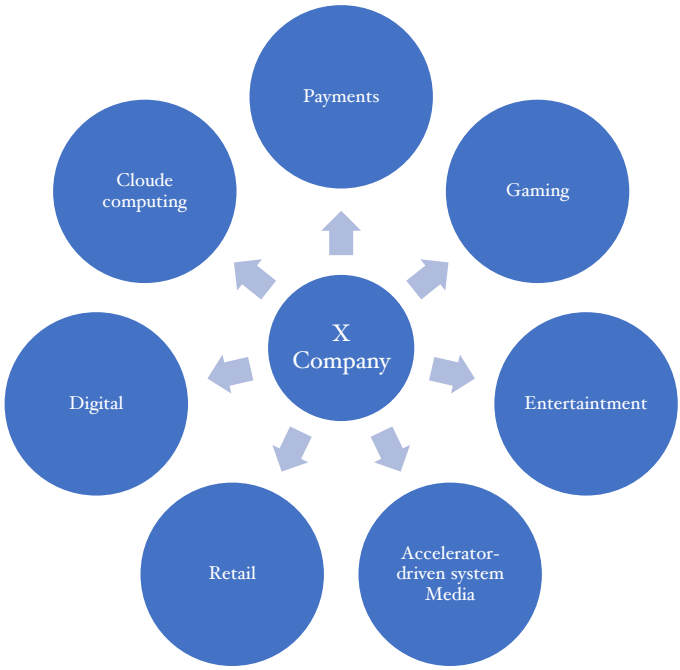

Figure 1. An Ecosystem Belonging to Company X.

Artificial intelligence-supported institutions or organizations within the ecosystem are managed and operated by autonomous decision support systems thanks to image processing and deep learning-based technology.

The ecosystem created by artificial intelligence technologies is basically composed of 'information'. Luciano Floridi, an Italian-born British philosopher who pioneered the study of information philosophy and ethics, redefines the atmosphere we live in. According to him, we are beings that share the infosphere, which is a global environment consisting of information that continues its existence as information organisms in an interconnected manner together with the software and hardware world that can interact with information technologies (Floridi, 2014, pp. 25-58). In this new ecosystem, which he defines as the infosphere, he ranks the beings according to the communication and interaction between technology and natural life. Technology-based ethical and philosophical issues, including

the artificial intelligence ecosystem, are linked to its position in the infosphere, the new ecosystem model.

Technology that enables communication and interaction environments is defined as the first-order technologies of the infosphere when positioned between human and natural stimuli (Fig.2).

Figure 2. First-Order Technology (Floridi, 2014, ss. 25-58)

Second-degree technologies in Figure 3 within Floridi's infosphere are technologies where the user is still human. They are technology models that connect users to other technologies rather than to an organic natural experience. At this level, humans still take an active role and realize their acquisitions, can direct the technology, and can intervene in the design and algorithmic flow.

Figure 3. Second-Order Technology (Floridi, 2014, p. 27)

In the information philosophy ecosystem model, in the third-degree technologies in Figure 4, people only benefit from technology and meet their vital needs related to values, beliefs and thought life, including economy such as production, marketing and finance, through this interaction cycle. In the third-degree technology classification that represents today's artificial intelligence ecosystem understanding, communication and interaction occur between production technology-technology-technology. Humans make decisions and carry out their activities outside of this cycle by benefiting from this ecosystem.

Figure 4. Third-Order Technology(Floridi, 2014, p. 29)

The active role of humans, where the designing, calculating and producing features have regressed to the level of consumption and utilization, has changed and evolved into a different role in this ecosystem. The ethical and philosophical problems that technologies such as the Internet of Things (IoT) bring to human life, such as communication between autonomous, intelligent computational digital devices without humans among them, are specifically deepening at this point. The ethical problems experienced in the collection, storage and processing of data in artificial intelligence technologies become more complex at the point where the technology establishes its own ecosystem.

Artificial intelligence ecosystems, which have a dynamic structure that allows collaboration between research organizations, universities and technology companies, bring with them ethical problems while developing new algorithms and technologies. The dynamic and constantly evolving structure of the ecosystem gives rise to different ethical agendas with the development of technology and new technologies included in the ecosystem. The increase in pragmatic results in the growing artificial intelligence ecosystem with the aim of optimizing the processes aimed at improving the quality of life of different technological components is pushing philosophical and ethical issues off the agenda or overshadowing them.

3. Ethical Challenges and Solutions in the Artificial Intelligence Ecosystem

Information is the epistemic source of moral actions (Taddeo, 2016, p. 362). With the processing of information with technology, issues such as usability, accessibility and accuracy have become sensitive ethical issues of our age. There are ethical challenges in the process of reconstructing or recombining existing resources through big data in the "digital innovation ecosystem", which refers to the macro-level big data organization of complex technologies, methodologies, concepts, business application areas, organizations and institutional contexts. Information technologies,

including artificial intelligence, are not just technical tools. They have the potential to intervene in human life as much as a human being due to their features such as machine learning and expert systems developed for decision support. Stating that the adoption of modern information technology is not only a technical but also a cultural endeavor, Capurro gives the example of current debates on privacy and the violation of privacy. According to him, ethical debates on the use of technology reflect its effects on our moral lives and culture (Capurro, 2006, p. 175).

As an example of big data innovation, big data entries are made every day to the social media platform, which is used as a digital data source to monitor various elements. These heterogeneous virtual platforms can create a digital innovation ecosystem by collaborating on issues such as data merging and sharing (Chae, 2019) . Issues such as storing, protecting and processing such a large amount of data without manipulation can cause problems such as privacy and data security.

Members of the ecosystem, which consists of companies, organizations, and universities, develop their skills together to achieve a new goal, and collaborate to develop new products and meet the needs of people or institutions using their data and experience. The new results obtained can be used in the development of the digital ecosystem (Hu, at al., 2016) and also prepare the ground for new members to join. In this way, as the ecosystem develops, it grows horizontally and vertically and forms a community structured with artificial intelligence. Moor states that institutions and organizations that do not take advantage of the opportunities of the new ecosystem, which he defines as the new ecology of competition, and remain outside the digital ecosystem, will experience losses in the sector and market share. In his article titled 'Predators and Prey: A New Ecology of Competition', Moor states that managers and companies that are limited to traditional industry perspectives will be eliminated by parties with new ecosystems. According to him, the future of companies must be managed by managers who have leadership that is compatible with the renewal of ecosystems and technological competence. Of course, ecosystems focused on producing faster and more than humans, such as artificial intelligence, and qualified managers and employees capable of managing these ecosystems are necessary (Moore, 1993). However, establishing such a system is

economically difficult, if not impossible, for many countries, let alone companies. Considering the speed of advancement of artificial intelligence technologies, it requires a large infrastructure to be included in the ecosystem formed by companies with technology and trained workforce. These and similar issues will create problems in justice and equal distribution of resources in underdeveloped or developing regions, and will also cause individual and psychological negative effects under the influence of economic depression. Therefore, without denying the benefits brought by the AI ecosystem, ethical development, equality and justice factors should be taken into consideration from the design of these technologies to the development stage of the ecosystem. Otherwise, it will not be a surprise if ethical difficulties arise from the difference between those who have technology and those who do not around the world (the digital divide).

Not having fair and equal access to technology may cause some imbalances in the context of social justice and human rights. Because some people, countries or social groups may be deprived of the opportunity to build and access[2] technology and an ecosystem designed with this technology. This will deepen the digital divide in society and the world. This will cause *Inequality of Opportunity* as strong communities that possess technology will be stronger than less developed regions. While developed countries can use artificial intelligence, automation and big data technologies in their own ecosystems in technology studies, those that do not have this opportunity will be in a situation where they are more consumers rather than producers. This situation, which is not compatible with human nature and disposition, will damage not only that society and community but also global justice. The fact that social and economic advantages are only on a certain side with ecosystems will deepen the gap between social classes. Therefore, artificial intelligence technologies and ecosystems are a critical issue that should be considered not only as an economic advantage but also

[2] The right to access content and the correct use of content are among the most controversial issues in computer ethics. In particular, the question of whether the control of access to content should be left to the courts or to the programmers within the ecosystem or to the approval of the company or institution is among the frequently discussed issues in overcoming ethical difficulties and in building a fair and equitable system(Lessig, 2004, pp. 152-153).

in the context of human rights and social justice (Stahl at al., 2020). Due to the nature of artificial intelligence machine learning, they can make decisions on their own and evaluate individuals with inappropriate criteria. This technology, which has the potential to exacerbate discrimination such as race, age and gender, can cause some implicit prejudices in users with inferences leading to open categorization discrimination (Stahl, 2022).

The dynamic structure of AI technologies and ecosystems with big data creates ethical challenges because intelligent systems such as AI have complex and interacting outcomes and inputs. Artificial intelligence and its ecosystems are in a cycle with continuous feedback in their working mechanism, including machine learning. If we consider that each data is transformed into output after processing and the outputs are included in the cycle as part of another pattern at the next stage, it will be very difficult to determine only particular ethical principles, unlike applied ethical approaches. Because the iterations involved in the data processing and output cycle are not as simple as in the areas that are the subject of applied ethics. They are quite complex.

Moor draws attention to the nature of information technologies in determining ethical principles in computers, which we can consider as the ancestors of artificial intelligence systems. According to Moor, algorithmic computational technologies have unlimited application potential almost everywhere with their logically malleable nature. Although this nature seems like an advantage, it is the source of many ethical problems (Moor, 1985, p. 269). According to him, this technology, which has a high potential to lead in many areas of our lives from finance to education, creates gaps that he defines as '*policy vacuum*'. For this, more comprehensive and holistic ethical policies should be developed than ethical principles (Moor, 1985, pp. 272-273). Based on Moor's assumptions, we can apply the same foundations to ecosystems. Indeed, the dynamic, innovative and multi-factorial interdisciplinary structure of AI ecosystems produces similar ethical problems.

Artificial intelligence ecosystems cover a wide area that includes technical development as well as social impacts. For example, there is more than one agent in the AI ecosystem. The discussion of who should take ethical responsibility in the ecosystem in the face of possible ethical issues

and problems is very important. Who will be held accountable for ethical violations in the Third Order technology ecosystem consisting only of machines?

4. An Approach to Modeling AI Ecosystems Around 'Ethical Responsibility'

In cases where more than one agent cooperates, the unauthorized use, manipulation or marketing of any data to third parties has brought to the fore the question of who will be responsible in the ecosystem for possible irregularities in political ecosystem applications such as democracy. Seeking an answer to the question of who is responsible for the uses or consequences of the system's action in a responsible ecosystem, Stahl proposes a joint distribution of responsibility throughout the ecosystem[3]. He points out that in decision-making processes that occur in the case of cooperation between multiple artificial intelligences, the ecosystem will be autonomous and that responsibility sharing will be required among different actors such as software developers, users, and institutions in the question of who will be responsible for the results caused by this system(Stahl, 2023).[4]

Since there is mutual dependency between the actors in the ecosystem in terms of activities, they develop together and evolve together in a way that will also achieve the basic purpose of the ecosystem (Ritala & Almpanopoulou, 2017, pp. 39-40). Since interdependent actors will be jointly affected by the consequences of the action and will jointly affect the outcome, they should assume their responsibilities in a distributed manner, as a requirement of cooperation. Stahl notes that intelligent systems that can make autonomous decisions based on input from their environment

[3] The ecosystem metaphor refers to a structure that occurs in different ways. Sthal states that the term ecosystem originally came from biology, referring to a geographical area in an ecosystem where plants, animals, and other organisms, as well as the weather and landscape, work together to form a bubble of life .Outside of biology, ecosystems are a popular concept that represents networks of individual components interconnected in complex ways, and this structure is based on the idea that the components of the system are a living organism (Stahl, 2021, p. 83).

[4] Some thinkers argue that robots, even though they are intelligent systems, cannot assume moral responsibility. It is emphasized that even if there is an ecosystem consisting of artificial intelligence technologies, the responsibility belongs to the human who designed this system (Sullins, 2006) .

have great potential to do good, but also raise important social and ethical concerns. These AI ecosystems need to be thought of in terms of meta-responsibility, or higher-level responsibility. This system does not only consist of technological actors, but also includes social structures, and for this a comprehensive ethical approach is required. This is the meta-responsibility framework. In fact, in this smart system, which depends on the technology, application areas, social context and other factors that make up the ecosystem, who or what is responsible includes its developers, users in various functions, as consumers, but also its co-designers, individual or institutional owners such as companies, social actors including policy makers and legislators, or even the technical system itself. Stahl, who argues that the concept of moral responsibility should be integrated into the ecosystem itself, argues that embedding responsibility in the ecosystems of intelligent systems will facilitate the development of socially acceptable approaches to thinking holistically in the search for ethical solutions. Because even though the AI ecosystem itself is related to economic or scientific activities, they produce a social result (Stahl, 2023).

Responsibility is a relational concept that occurs between the subject and the object, connecting a subject to an object. In this relationship, it is clearly known on which side the responsibility lies. The conditions and actions that allow determining who is responsible for what and how are clear and explicit. Therefore, crime and criminal legal responsibilities are also clear. Stahl calls this structure in Figure 5 the simple responsibility relationship.

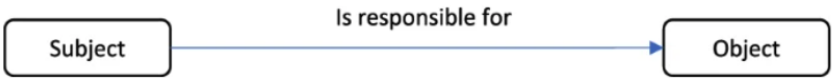

Figure 5. Simple Responsibility Relationship (Stahl, 2023)

In systems where the number of relationship connections is exponential and more than one actor is involved in ecosystem activities, determining responsibility is not so easy. For example, the three components in

the center of Figure 6 represent the responsible subject, the object for which the subject is responsible, and the authority that determines and implements the practical results of the responsibility relationship. Surrounding the core responsibility relationship are the elements that affect social realities. Here, the question of who will assume responsibility in what degree in the ecosystem arises. This brings with it a new problem regarding the type of responsibility. Every responsibility relationship and situation has a moral component, but here it triggers the problem of which actor will be at the forefront in assuming responsibility (Stahl, 2023).

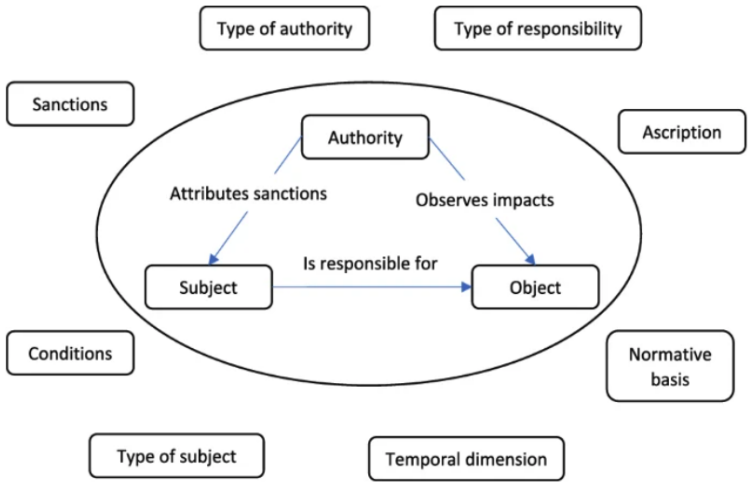

Figure 6. Complicating Factors in The Responsibility Relationship (Stahl, 2023)

In Stahl's Responsible Ecosystem thinking, each expert and user acts at the centre of the concept of 'responsibility' in promoting collectively useful, acceptable, desirable and sustainable outcomes, while remaining within their own sphere of responsibility (Stahl, 2023).

Who will assume ultimate responsibility in the artificial intelligence ecosystem? How should ethical responsibility be distributed in the AI ecosystem? Who/what will be responsible for the ethical design of the ecosystem, its use, and the problems that may arise in the final stages? Is AI sufficient to solve ethical responsibility in the ecosystem?

5. A Proposal for Modeling Artificial Intelligence Ecosystems on the Axis of Ethical Development: Flourishing Ethics

Due to the value it provides to companies and organizations, developments in the world of information technology should not be limited to technological advances, but should be designed on an ethical basis and in harmony with human nature and the moral values of societies. Indeed, humanity has found the opportunity to carry its scientific and technical capabilities to the future thanks to ethical values and has been able to build civilizations by going beyond being a community. Scientific and technical activities have provided us with an instrumental value in meeting our basic needs, and ethics have ensured the sustainability of these gains. Therefore, ethical studies are as vital to humanity as our scientific activities.

Artificial intelligence and its ecosystem, which have strong potential in terms of technological development and innovation, have been discussed in recent years in terms of their ethical dimensions as well as their popularity. Since artificial intelligence technologies have a socio-technical nature and affect individuals and society (Stahl, 2023), they should also focus on the ethical development of people, as they are not purely technical developments. In fact, research shows that the most prominent issues in the digital ecosystem are human rights issues and challenges (Stahl et. al, 2020).

In recent years, institutions and organizations working in the field of human rights have particularly emphasized this issue. For example, the European Union Treaties and the European Union Charter of Fundamental Rights (European Commission) draw attention to the importance of respecting fundamental rights by focusing on humans and ethical values in artificial intelligence and ecosystem studies. In this context, human values should be at the center of the flourishing, deployment, use and monitoring of artificial intelligence systems. Because the element that is primarily affected by technology is humans. An approach that focuses on the ethical flourishing of humans in artificial intelligence and its ecosystem will also contribute to the qualified progress and development of the technological world. As stated in the European Commission, humans have a unique and inalienable moral status. An ethical approach that focuses on humans and their values will pave the way for a sustainable approach that ensures the

development of future generations (*Ethics Guidelines for Trustworthy AI | Shaping Europe's Digital Future*, 2019).

From the problems that arise within the complex network of relationships between artificial intelligence and the ecosystem to the design of the ecosystem, the flourishing right of humans should be prioritized. This issue can be the opportunity to sustain the lives of individuals and society efficiently and to overcome technology-based problems/issues. In this context, Terrell Ward Bynum's theory of 'flourishing ethics', which is a proposal for information ethics, provides an important perspective for the ecosystem it creates, including artificial intelligence. Similar to the approaches focused on the concept of responsibility above, this section also emphasizes the idea of in human and non-human systems.

In philosophy, based on Aristotle's understanding of ethics and biology and Norbert Wiener's understanding of cybernetic science and ethics, Flourishing Ehics theory argues that there is a close relationship between the purpose of human life and human information processing capacity. According to Bynum, humans, as a species of animal; are beings that receive information from the outside world, process and store information in line with the capabilities and possibilities of their current nature, establish connections between old and new information, gain new experiences and behave. Including intelligent computational systems such as artificial intelligence, humans process the information they receive from the outside world and design and carry out their own purpose and actions. This process is the mechanism underlying the development of artificial intelligence and ecosystems. In order for intelligent systems to reach the best, they should be produced in a way that contributes to the development of the best, which is happiness, from the design stage to the final stage.

Flourishing Ethics theory consists of two main components that feed each other. These are;

a) Human-Centered Flourishing Ethics focuses solely on humans and their development,

b) General Flourishing Ethics deals with all beings and their development within the non-human universe, including artificial intelligence technologies that include humans (Bynum, 2006, p. 158) [5].

The AI ecosystem should focus not only on the development of technical skills but also on the increase of ethical awareness, which is an activity aimed at the meaningful well-being of humans, and on the development of human nature in the best way. FE theory indicates that technology should be designed and used in a way that aims for the best for both humans and society. Thus, the ethical flourishing of humans and the technical development of artificial intelligence will feed and strengthen each other. This ethical perspective indicates that technology should contribute to human flourishing in every way.

Due to the dynamic nature of the ecosystem, it is not appropriate to determine separate ethical principles for each business. Because, although living and nonliving structures come together in the ecosystem to form a heterogeneous structure, each artificial intelligence acts for different purposes within itself to produce economic and social value. Each actor in the heterogeneous structure of the ecosystem acts in discrete relationships, processes data and interacts for their own and the ecosystem's purpose. Due to the multiple data inputs and complex transaction structure, the results in the ecosystem are produced jointly. This results in the fact that it is often not possible to draw a clear line between a specific component of the system and a clearly defined result. Therefore, it is quite difficult to create single ethical rules for the ethical problems of the ecosystem.

Ecosystems have a dynamic structure that can develop and grow or wither and die. Ecosystems can form intertwined subsystems for similar purposes. In other words, they can form multiple sub-ecosystems within themselves. An action in the ecosystem can affect or manipulate the results of other actors. Ecosystems have a flexible structure that can innovate to

[5] In this system, human and non-human beings are information objects that must contribute to the flourish of the universe. The common goal of every being is to strengthen its ethical existence in order to slow down the destruction of the second-order thermodynamic law, as mentioned in physics. Entropy is a universal evil, it is not possible to stop this evil completely, but it can be slowed down with moral equipment (Kantar, 2022, pp. 163-204).

create systems outside of themselves. For this reason, the system is always ready for change and transformation. In order to overcome ecosystem ethical problems, the issues need to be addressed with an inclusive, holistic and unifying ethical perspective and moral methods appropriate to this structure need to be developed.

The present article draws attention to the Floursihing Ethicstheory, which has the potential to provide a basis for determining ethical principles for artificial intelligence and ecosystems and for ethically connecting artificial intelligences in the ecosystem. It argues that the technological atmosphere should plan every action based on the idea that human flourishing is the central ethical value. Indeed, Flourishing Ethics can provide a common ethical foundation for a wide variety of cultures and communities around the world. The theory holds that members of each particular culture or community can add to this umbrella ethical approach their own particular cultural values that they value and that help them make sense of their moral lives (Kantar & Bynum, 2022). This includes non-human computing technologies such as artificial intelligence ecosystems.

In their study titled *Flourishing Ethics and identifying ethical values to instill into artificially intelligent agents*, published in the journal Metaphilosophy in 2022, Kantar and Bynum asked what is fundamentally necessary for human flourishing and what deficiencies make it impossible for them to develop. They determined a number of principles based on Flourishing ethical theory. The results were as follows:

1. Supporting people's ability to make and act on important choices
2. Involving people in a supportive community that will enable them to thrive
3. Ensuring that they have safety, information, opportunities and resources, regardless of the type of community they are in.
4. Ensuring justice to maximize flourishing within the community in which they live (including 'distributive justice' and 'retributive justice')
5. Mutual respect between people, including self-respect for oneself (Kantar and Bynum, 2022)

Of course, human flourishing is not limited to these five principles. However, the prosperity and development of digital life is not possible without these principles. These principles are also extremely important for

the ecosystem consisting of the most complex relationships and connections of artificial intelligence systems, from the data collection stage to machine learning and the results stage.

The stakeholders and the ecosystem within the ecosystem should be designed (see. Fig 7) in a way that focuses on material and technical value and supports human flourishing beyond harming human ethical flourishing. The perspective of human flourishing should be at the center as a determining factor in all stages, from the infrastructure studies, which are the first stage in which Artificial Intelligence technologies are created, to the applications and industrial products created with artificial intelligence.

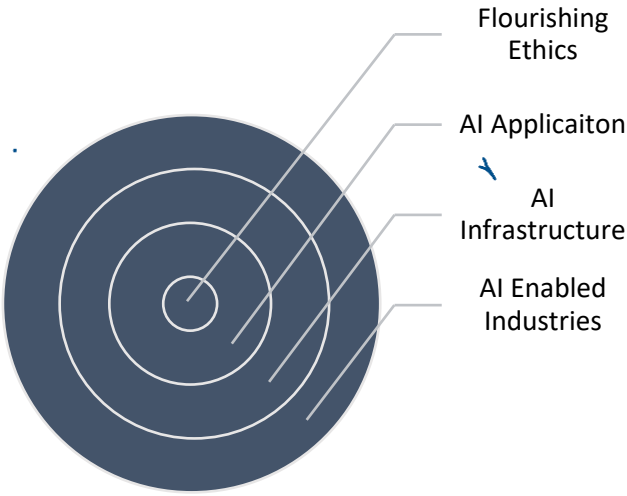

Figure 7. Floursihing -Oriented AI Ecosystem, developed by the author

6. Conclusion

AI has the potential to develop biases that threaten justice and equality during the data it collects and learning processes. Algorithms created to trigger biases in categories such as race and age could lead to serious ethical problems in the AI ecosystem. Target audience of the ecosystem Artificial intelligence, which analyzes and predicts individual behaviors using big data in the profile creation stages, can lead to violations that threaten privacy, confidentiality, and the right to be forgotten in the collection, storage and processing of personal data. The greater autonomy of the AI ecosystem, which consists of complex systems, brings with it the question

of how controllable these systems are. When systems in the AI ecosystem can be managed with unmanned control, AI, especially in the military field, causes dangers and ethical problems in issues such as autonomous weapons and security. Automation processes that replace human labor in the AI ecosystem can cause unemployment and economic imbalances. Since Advanced Automation will make humans dependent on machines in decision-making, it can negatively affect human freedom and the development of human ethical nature.

The article outlines a general perspective on the development of ethical approaches to ethical problems and problem solutions of artificial intelligence systems. The method in the study consists of the foundation of approaches with a philosophical-ethical context and theoretical basis. For an inclusive ethical perspective on the solution of the debates brought about by artificial intelligence and its ecosystems, the Flourishing Ethics theory proposes a human-centered inclusive ethical perspective on the ethical problems of the ecosystem. It is emphasized that the development of humans and the universe should be centered as a preventive approach in the solution of ethical problems caused by artificial intelligence technologies. Therefore, artificial intelligence ecosystems need to be designed for human flourishing.

Humans are the only beings responsible for their own lives. As a moral subject, humans have a moral status as a being at the core of actions. As the central member of the ecosystem, humans are inherently responsible not only for themselves but also for future generations and other beings. This characteristic of man makes him highly responsible for moral sustainability. A sustainable approach that ensures the flourishing of other living beings and future generations is therefore important. The concept of flourishing, which refers to a holistic ethical perspective, is thought to have the potential to contribute to ethical sustainability. What makes artificial intelligence a controversial issue is its potential to be involved in decision-making processes based on the data it learns, beyond performing human-like tasks. With this potential, artificial intelligence technologies and ecosystems should be designed in a way that contributes to the human flourishing and all beings in general.

AI ecosystems should be developed to reduce and eliminate global injustice, not to support it, and they should be designed to be sustainable, and focus should be placed on developing ethical policies in this direction.

The focus of most discussions of artificial intelligence and ecosystem ethics is on the negative effects on human ethical flourishing. For this, the basic proposal of this study is that all socio-technical tools, including the ecosystem, should be designed by considering human ethical flourishing and even focusing on ethical development. The idea of adapting the Flourishing ethical theory to the ecosystem should not be considered as a single key that opens every door. The main purpose here is to create a broad perspective for the construction of the future by taking into account the ethical elements that are indispensable for humans, rather than a system that focuses solely on material gains, where humans are in the background or their nature and ethical needs are ignored. Because a good future will be possible in an atmosphere where the ethical flourishing of humans is prioritized with an advancing and developing understanding of technology.

References

1711—Artificial Intelligence Ecosystem Call | TÜBİTAK | Türkiye Bilimsel ve Teknolojik Araştırma Kurumu. (t.y.). Geliş tarihi 16 Aralık 2024, gönderen https://tubitak.gov.tr/en/funds/sanayi/ulusal-destek-programlari/1711-artificial-intelligence-ecosystem-call

Bynum, T. (2006). Flourishing Ethics. *Ethics and Information Technology*, *8*, 157-173. https://doi.org/10.1007/s10676-006-9107-1

Capurro, R. (2006). Towards an ontological foundation of information ethics. *Ethics and Information Technology; Dordrecht*, *8*(4), 175-186. http://dx.doi.org.scsu.idm.oclc.org/10.1007/s10676-006-9108-0

Chae, B. (Kevin). (2019). A General framework for studying the evolution of the digital innovation ecosystem: The case of big data. *International Journal of Information Management*, *45*, 83-94. https://doi.org/10.1016/j.ijinfomgt.2018.10.023

Ethics guidelines for trustworthy AI | Shaping Europe's digital future. (2019, Nisan 8). https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai

Floridi, L. (2010). Ethics after the Information Revolution. İçinde L. Floridi (Ed.), *The Cambridge Handbook of Information and Computer Ethics* (ss. 3-19). Cambridge University Press. https://doi.org/10.1017/CBO9780511845239.002

Floridi, L. (2014). *The 4th revolution: How the infosphere is reshaping human reality*. Oxford University Press.

Hu, H., Huang, T., Zeng, Q., & Zhang, S. (2016). The role of institutional entrepreneurship in building digital ecosystem: A case study of Red Collar Group (RCG). *International Journal of Information Management*, *36*(3), 496-499. https://doi.org/10.1016/j.ijinfomgt.2015.12.004

Kantar, N. (2022). *Bilişim Felsefesinde Etik Arayışlar ve Gelişim Etiği*. Aktif Düşünce Yayıncılık.

Kantar, N., & Bynum, T. W. (2022). Flourishing Ethics and identifying ethical values to instill into artificially intelligent agents. *Metaphilosophy*, *53*(5), 599-604. https://doi.org/10.1111/meta.12583

Lessig, L. (2004). *Free Culture: The Nature and Future of Creativity*. Penguin.

Moor, J. H. (1985). What Is Computer Ethics? *Metaphilosophy*, *16*(4), 266-275. https://doi.org/10.1111/j.1467-9973.1985.tb00173.x

Moore, J. F. (1993). Predators and prey: A new ecology of competition. *Harvard Business Review*, *71*(3), 75-86.

Novikov, D. (2016). Cybernetics, Control Philosophy and Control Methodology. İçinde *Studies in Systems, Decision and Control* (ss. 21-26). https://doi.org/10.1007/978-3-319-27397-6_2

Ritala, P., & Almpanopoulou, A. (2017). In defense of 'eco' in innovation ecosystem. *Technovation*, *60-61*, 39-42. https://doi.org/10.1016/j.technovation.2017.01.004

Russell, S. J., & Norvig, P. (1995). *Artificial intelligence: A modern approach*. Prentice Hall.

Stahl, B., Andreou, A., Brey, P., Hatzakis, T., Kirichenko, A., Macnish, K., Shaelou, S., Patel, A., Ryan, M., & Wright, D. (2020). Artificial intelligence for human flourishing -Beyond principles for machine learning. *Journal of Business Research*, *124*. https://doi.org/10.1016/j.jbusres.2020.11.030

Stahl, B. C. (2021). *Artificial Intelligence for a Better Future: An Ecosystem Perspective on the Ethics of AI and Emerging Digital Technologies*. Springer Nature. https://doi.org/10.1007/978-3-030-69978-9

Stahl, B. C. (2022). Responsible innovation ecosystems: Ethical implications of the application of the ecosystem concept to artificial intelligence. *International Journal of Information Management*, *62*, 102441. https://doi.org/10.1016/j.ijinfomgt.2021.102441

Stahl, B. C. (2023). Embedding responsibility in intelligent systems: From AI ethics to responsible AI ecosystems. *Scientific Reports*, *13*(1), 7586. https://doi.org/10.1038/s41598-023-34622-w

Sullins, J. P. (2006). When Is a Robot a Moral Agent? *International Review of Information Ethics*, *6*(12), 24-30.

Taddeo, M. (2016). The Moral Value of Information and Information Ethics. İçinde *The Routledge Handbook of Philosophy of Information. Routledge* (ss. 361-374)

Öz: Sibernetik ve bilişim bilimi geleneksel/yerleşik sosyal, politik ve felsefi tecrübelerimizi derinlemesine değiştirmekte, yeni yol ve yöntemlerle şekillendirmektedir. Coğrafi bilimin tarif ettiği atmosfer kavramına referansla yapay zekâ ekosistem modelleri, bilişim teknolojilerinin oluşturduğu infosfer, çağımıza ait yeni etkinlik alanlarıdır. Bilişim devrimiyle pragmatik konfor alanının etkisine giren düşünsel ve ekonomik edimlerini akıllı sistemler aracılığıyla gerçekleştiren günümüz insanı, yeni-eski dilemması karşısında etik sorunlarla yüzleşmek durumunda kalmıştır. Nitekim gündelik ve kurumsal işlerde insan odaklı geleneksel uygulamalar yerine yenilikçi yapay zekâ temelli uygulamalar tercih edilmektedir. Yapay zekâ ve ekosisteminin geliştirilmesinde insana ait değer alanından daha çok pragmatik faydaya odaklanılmaktadır. Bu tutum yapay zekâ teknolojilerinin hedeflerini geliştirirken çoğu zaman etik değerlerin arka planda kalmasına neden olmaktadır. Çalışma, yapay zekâ ve ekosistemindeki etik sorunları ve insanın etik gelişimini muhafaza eden yapay zekâ ekosistem modelini konu edinmektedir. Ayrıca, yapay zekâ etik politikalarına uygulanabilirliğini savunan insan odaklı yapay zekâ ekosistem modeli teklif edilmektir.

Anahtar Kelimeler: Yapay zekâ, yapay zekâ ekosistemi, bilişim felsefesi, bilişim etiği, etik.