Exploring the Technical Path of Social Governance from the Perspective of Value-Sensitive Design — A Case Study of Noise Decibel Detection Lamps

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Abstract. In the wave of generative artificial intelligence, the leap in digital technology has not only opened a new chapter in human civilization but also posed higher demands on the ethical complexity and value diversity of social governance. As technology becomes deeply integrated into daily life, we need to comprehensively examine its essence. External regulation and critique are no longer sufficient to address technological development; guiding technology towards good through internal design has become key, highlighting the importance of technical governance as a new path for social governance. As an essential dimension of technical governance, Value-Sensitive Design (VSD) has garnered significant attention due to its ethical implications and cutting-edge practices. VSD considers various moral values in design, ensuring that technological development aligns with societal visions. By clarifying value orientations, VSD places human values at the core, iterating designs to ensure that technology aligns with social ethics. This paper explores the design and application of noise decibel detection lamps based on VSD, embodying the concept of "tranquility, harmony, and order," playing an active role in enhancing well-being and optimizing governance, and providing valuable insights for technological innovation and social governance.

Keywords: value-sensitive design, noise decibel detection lamp, technology ethics, social governance

1. Introduction

Recently, generative artificial intelligence has appeared in various fields of our lives. Against the backdrop of continuous iterations of science and technology on an international scale, digital technology has become a crucial force in social development. **At the same time, digital technology has brought about a series of new social problems**, such as AI assistants, smart homes, and autonomous driving.

In the field of AI assistants, scholars Liu Zhen and Zhao Yunze emphasized in "Technical Logic, Implementation Methods, and Realistic Boundaries: The Deep Impact of Generative AI on the Publishing Industry" the need to delineate the boundaries between AI-generated content and professional content, to be wary of the potential impact of technological capital on the publishing industry, and to pay attention to the power and ethical boundaries between humans and machines. [1] In the field of smart homes, scholar Chen Jinchan, in "Exploring the Design Principles of Smart Homes under Traditional Artifact Ethics," revealed the security risks of algorithmic black boxes and advocated for incorporating humanistic care and ecological concepts into design. [2] In the field of autonomous driving, since autonomous vehicles find it difficult to make decisions that meet human moral standards when facing ethical dilemmas, the "New Generation Artificial Intelligence Development Plan" issued by the State Council in 2017 proposed the construction of an ethical system for artificial intelligence for the first time as part of its three-step strategic goal. In the Fifth Plenary Session of the 19th Central Committee in 2020, General Secretary Xi Jinping also proposed the establishment of a "scientific ethical system." In response to this, many scholars have put forward countermeasures. For example, Millar et al. proposed applying universal machine ethics to autonomous vehicles by designing an ethical dilemma assessment tool to evaluate the control decisions of autonomous vehicles. In summary, design has become a key approach to solving the ethical issues of digital technology. It is necessary to integrate diverse value concepts into technical products to guide them in making decisions that meet human moral standards, thereby exerting positive social effects.

Therefore, the development of digital technology requires "internalist" technological ethical thinking. Technology, as the cornerstone of human civilization, has been intertwined with humanity throughout history. However, the philosophical exploration of technology did not receive systematic attention until modern times. The German philosopher Ernst Kapp's

"Principles of a Philosophy of Technology" became a milestone in this field, marking the establishment of the philosophy of technology in the history of philosophy. Western Marxism emerged from the late 19th to early 20th century, with technical criticism being a key part of its theoretical innovation. Early scholars such as Lukács and Karl Kautsky focused on the problem of alienation under capitalist production methods, revealing how technology exacerbates the estrangement of workers from production. With the rise of the Frankfurt School, scholars such as Adorno and Horkheimer further pushed technical criticism to a climax, exposing the role of technology as a tool of domination in modern capitalist society. Overall, Western Marxist technical criticism theory has evolved from the contradiction between productive forces and production relations, to the critique of technical rationality, and to the multi-dimensional exploration of the interaction between technology and social culture. However, its analysis is often linked to political revolution, and detailed analysis of specific technologies remains insufficient.

2. New Paths for Social Governance in the Technological Era

Today, digital technology has begun to shape our living environment. As Skinner pointed out in his book "Beyond Freedom and Dignity," human behavior is shaped by the environment, and by creating the environment, we can guide people's behavior. Therefore, we should shift from the perspective of externally regulating technology to designing from within. In Zhang Wei's book "Internalist Technology Ethics," it is emphasized that technology itself carries certain values and moral principles [3], advocating for pluralistic values, responsibility ethics, and public participation. First, pluralistic values suggest that technology should serve multiple value goals, including but not limited to economic benefits, social justice, and ecological sustainability. Second, responsibility ethics emphasizes that designers, users, and managers of technology should assume corresponding moral responsibilities to ensure the safety and sustainable development of technology. Third, public participation advocates that technological decisions should fully consider the interests and opinions of the public, ensuring the democratization and fairness of technology. These theoretical foundations provide strong support and basis for internalist technology ethics.

Value-Sensitive Design (VSD) is a method within the approach of internalist technology ethics, aiming to ensure that human values are fully considered in the process of technology design. It emphasizes that technology design is not just an engineering practice but a moral practice. Therefore, technology designers need to consider the impact of technology on human values during the design phase. VSD posits that technology is not value-neutral but can embody and convey specific values. Hence, this theory advocates for the proactive identification and integration of the values and needs of relevant stakeholders during the technology design and development process.

VSD was proposed by Batya Friedman and Peter Kahn at the University of Washington in the late 1980s and early 1990s. Its theoretical foundation includes knowledge from fields such as ethics, philosophy of technology, sociology, and anthropology. It draws on value theories in moral philosophy, such as Dworkin's value integration theory and MacIntyre's practice theory, to identify and analyze values. Additionally, VSD incorporates insights from STS (Science, Technology, and Society) studies, which view technology as socially constructed, emphasizing the interaction between technology and social values. In 2003, "Responsible Research and Innovation" (RRI) represented the academic community's long-term concern for the social role of science and technology. It is a value and procedural approach to predicting and evaluating the potential impacts and social expectations of research and innovation, aiming to promote inclusive and sustainable processes and outcomes. "Responsible" means responding to a constantly changing environment, focusing on the public value of the developed technology, understanding what kind of social impact it should generate, and how to promote such impact, and adjusting by changing the form or direction of innovation. The development of RRI has significantly promoted ethical reflection in the field of human-computer interaction, influencing the proposal of VSD. Over the past 20 years, VSD has evolved into one of the core consensuses of the human-computer interaction community, reflecting a shift towards values in engineering design and a design shift in value thinking.

Value-Sensitive Design (VSD) represents the use of "conceptual investigations, empirical investigations, and technical investigations" by designers to integrate "values" and "responsibility" into product design, allowing technological products to exert positive social effects. Values, as universally pursued beneficial goals in social life, often focus on promoting technology for good and humanistic care, both of which are highly advocated in the application of technology. At the same time, ethics constitute the recognized standards of right and wrong within a social group, clearly defining which rights and obligations are normative in social activities. The concept of "responsibility" not only carries an ethical demand but also expresses a commitment to specific values, manifesting in motivation, commitment, and behavior. It represents the subjective initiative and self-discipline of individuals or groups in their actions. Designers, as the bridge between creativity and execution, have a core ability to integrate values and responsibility into their design outcomes, thereby constructing real, good, and beautiful social spaces. This ability requires designers to possess not only professional knowledge and skills but also a deep ethical awareness and profound insight into society. Through responsible design, designers can consciously use their expertise to promote social change and contribute to building a more harmonious and just social environment.

Based on "internalist" technology ethics and the VSD method, technology can become a new path for social governance. We need to clarify the concepts of governance and technological governance. Scholar Liu Yongmou, in "General Theory of Technological Governance," deeply defines "governance" and "technological governance." Citing the views of Gerry Stoker, he emphasizes that governance, as a shift in the guiding principles of social operation, relies on the interaction of multiple subjects rather than state coercion. [4] Liu Yongmou further proposes four key points of governance: 1) The subjects of governance are diverse and not limited to the government; in some contexts, the government may not even play a leading role in governance activities. 2) Governance activities emphasize interaction, where all parties involved actively and dynamically participate, avoiding

reliance on unequal coercion as much as possible. 3) Governance activities emphasize continuous self-organizing movements, "creating" governance outcomes that satisfy all parties involved during the process. 4) Governance activities often achieve varying degrees of control through reasoning, characterized by the combination of knowledge and power, rather than the combination of violence and power. [5]

Based on this foundation, Liu Yongmou defines "technological governance" as the governance activities that systematically apply modern scientific and technological achievements to improve the efficiency of social operations, particularly in political and economic fields. This concept highlights the technical nature of technological governance, the extensive use of modern technological achievements, and the core goal of enhancing the efficiency of social operations. [5]

Firstly, technological governance is necessary. It can collect and analyze large amounts of data in real-time, respond quickly to social issues, and improve the efficiency and accuracy of governance. For example, through big data platforms, the government can monitor urban traffic, public safety, and other areas in real-time and take corresponding measures promptly. Technological governance helps break down the barriers of information asymmetry, allowing more people to participate in social governance, thus promoting fairness and justice in society. For instance, through social media platforms, the public can promptly understand government decisions and policy implementations, and express their opinions and suggestions. As society develops rapidly, social issues become increasingly complex and diverse, making it difficult for traditional governance methods to meet the demand. Technological governance can provide more precise and efficient solutions to address complex and changing social problems.

Secondly, technological governance is feasible. In recent years, modern technologies such as big data, cloud computing, and artificial intelligence have developed rapidly, providing a solid technical foundation for technological governance. These technologies have been widely applied in various fields of social governance and have achieved remarkable results. At the same time, with the advent of various artificial intelligence technologies in people's lives, there is an urgent need for society to strengthen governance. Technological governance can meet the public's demand for efficient, convenient, and precise social governance, gaining widespread recognition and support. Therefore, our approach to these technologies should not be one of blind opposition or support but should recognize the positive role of technology and use it to govern society, guiding technology towards good.

3. The Theory and Methods of Value-Sensitive Design

This paper posits that the theory of Value-Sensitive Design (VSD) rests on three important principles: the human-technology community, the dynamic nature of values, and systemic consideration. Based on these three principles, VSD employs three methods: conceptual investigations, empirical investigations, and technical investigations. The combination of these principles and methods builds a bridge between the theoretical and practical aspects of VSD.

Firstly, technology is not merely a tool or means but is closely linked with human society, culture, and values. During the design process, designers should fully consider human needs, expectations, experiences, and cultural backgrounds to ensure that technological products can coexist harmoniously with human society and promote holistic human development. This adheres to the principle of the human-technology community. Secondly, values change over time and across different contexts. During the design process, it is essential to consider the dynamic nature of values to ensure that technological products can adapt to value changes in different times and contexts. The principle of value dynamism requires designers to maintain openness and flexibility in the design process, continuously paying attention to changes in social, cultural, and economic aspects and adjusting design concepts and plans in a timely manner. Lastly, designers must systematically consider all aspects of technological products during the design process. This includes integrating and prioritizing the values of various stakeholders, as well as considering hardware, software, user interfaces, and interaction methods, ensuring coordination and consistency across all levels.

Having established the three principles of applying VSD theory in product design, we need to determine the three methods for applying VSD: conceptual investigations, empirical investigations, and technical investigations.

First, as the cornerstone of value-sensitive design, conceptual investigations involve analyzing the core issues and structure of the investigation, as well as exploring theoretical or philosophical aspects. This usually involves questions such as: Who are the stakeholders? What matters might be critical for human and non-human stakeholders? How will the design team incorporate specific ethical or cultural frameworks into the design process to support principled reasoning? What values might be affected? How will these values be framed and described? What conceptual models (if any) will be used to operationalize specific values or a set of values? [6] At this stage, designers must clarify design goals, boundaries, and identify key concepts and values such as privacy, security, trust, and related techno-social issues. Using tools from disciplines like philosophy, ethics, and sociology, designers can deeply analyze these concepts and build a clear and comprehensive design framework, laying a solid foundation for subsequent work. Conceptual investigations not only ensure the correctness and effectiveness of the design process but also help identify and predict ethical issues, providing theoretical support for prevention and resolution.

Second, empirical investigations are the core component of value-sensitive design, focusing mainly on the value considerations of technology users and stakeholders. During this phase, designers need to employ quantitative and qualitative research techniques from sociology, such as surveys, in-depth interviews, and participant observations, to collect and interpret consumers' needs, visions, values, and interest conflicts. The emphasis of empirical investigations is on understanding and respecting users' perspectives and feelings, ensuring the design truly meets their needs and expectations. Through empirical investigations, designers can gain deep insights into user behavior patterns, psychological traits, cultural backgrounds, and other factors, allowing them to more accurately grasp user needs and expectations.

Third, in the empirical investigation phase, designers need to use various data analysis methods, such as descriptive statistics, factor analysis, and cluster analysis, to reveal the inherent patterns and characteristics of user needs and expectations. These analysis results can provide important references and bases for designers, helping them better formulate design strategies and plans.

The significance of empirical investigations lies in helping designers establish close connections and communication channels with users, ensuring the design truly aligns with user needs and expectations. Additionally, empirical investigations can help designers identify and predict potential practical problems and challenges in the design, providing practical experience for subsequent solutions and optimizations.

Fourth, technical investigations are a crucial part of value-sensitive design, focusing mainly on the characteristics and limitations of the technology itself. In this phase, designers need to use technical analysis and evaluation methods, such as prototype design, simulation modeling, and experimental verification, to assess the degree to which the technical design supports or hinders specific values. The focus of technical investigations is on evaluating the feasibility and effectiveness of the technology, ensuring it truly supports the design goals and values. Through technical investigations, designers can deeply understand the principles, characteristics, and limitations of the technology, allowing them to more accurately assess how the technical design supports or hinders specific values.

No single type of investigation is sufficient on its own; instead, these three types of investigations need to complement, shape, and reshape each other. [6] The iterative integration of these three methods forms the complete framework and methodological system of value-sensitive design, providing designers with a comprehensive, systematic, and scientific design approach and tools. Through the application and practice of these methods, designers can gain a deeper understanding and attention to human values, morals, and ethical factors, creating technological products and services that better meet human needs and embody humanistic care.

4. Case Study of Value-Sensitive Design

To explore the practical effectiveness of value-sensitive design in social governance, this paper addresses the pressing issue of noise pollution, which severely harms public physical and mental health. Experts and volunteers from fields such as philosophy, automation, industrial design, and architecture were recruited to collaboratively develop a noise decibel detection lamp. This innovative product not only detects and accurately displays environmental noise levels in real time but also has an intelligent sensing function. When noise exceeds a preset threshold, the lamp lights up automatically and turns off when the noise subsides. This design aims to convey the core values of "tranquility, harmony, and order" to the public in an intuitive and visual way, effectively enhancing the efficiency of social governance, improving public welfare, and creating a more livable social environment.
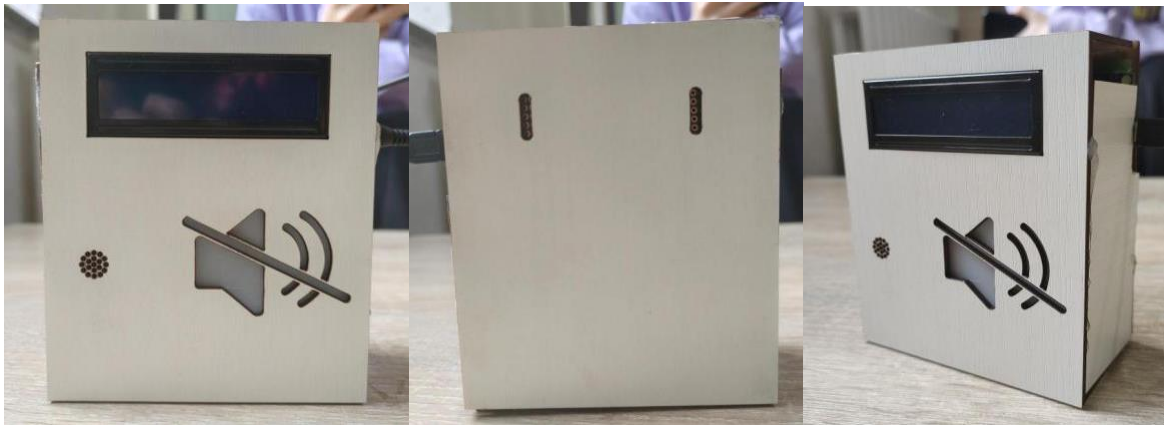
Figure 1. Product Image

During the design phase, this product primarily adhered to the three principles of VSD and the methods of conceptual investigation, empirical investigation, and technical investigation.

Firstly, in accordance with the human-technology principle, we identified the product's stakeholders, including direct stakeholders and indirect stakeholders (the indirectly affected groups and future generations).
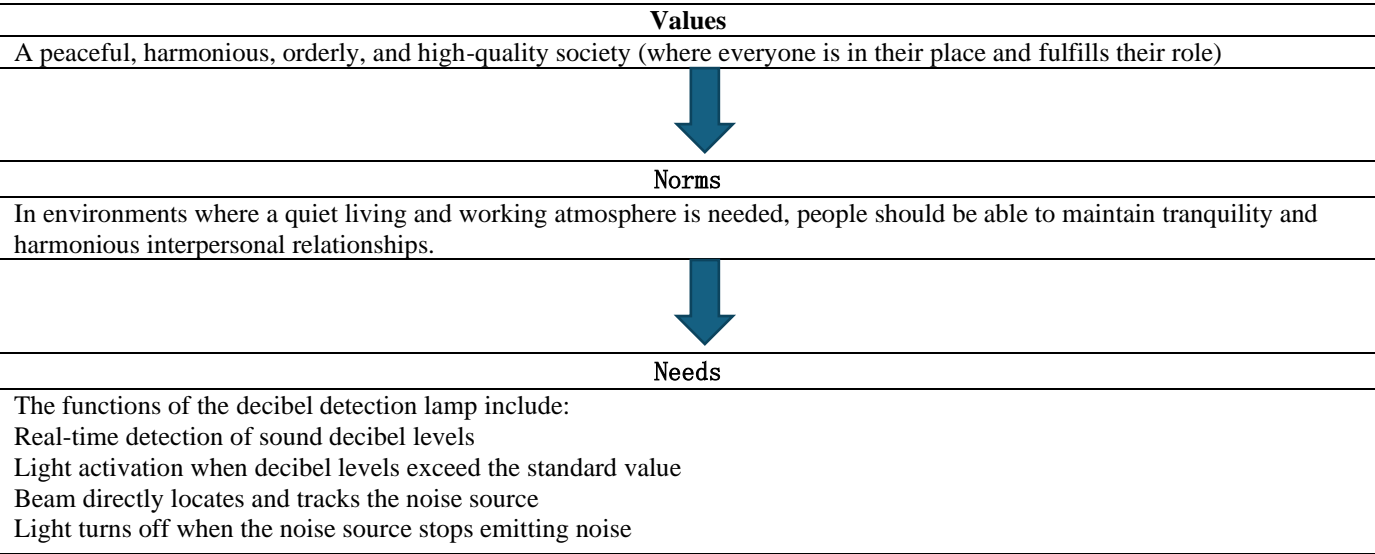
Table 1. Decibel detection lamp's affections on different people

Direct users	Indirectly affected groups	Future generations

Individuals or organizations needing to monitor and control noise levels, such as residents, businesses, government departments, and transportation sectors, can use a decibel detection lamp to promptly understand the noise levels in their surroundings. This allows them to take appropriate measures to reduce the impact of noise on health and quality of life.	1. People in the surrounding environment: The decibel detection lamp is imbued with values of "peace, harmony, and order." Although the number of environments where the decibel meter is installed may be limited, the values it conveys can influence people in other environments. 2. Environmental organizations and activists: For organizations and activists concerned with environmental pollution and noise pollution, the decibel detection lamp may attract their attention and prompt them to take relevant actions. 3. Government agencies and regulatory bodies: The installation and use of the decibel detection lamp may need to comply with relevant regulations and standards, prompting government agencies and regulatory bodies to introduce new policies and regulations.	Future generations will also be affected by the decibel detection lamp, as the current state of environmental quality will impact the living environment and health industry of the future. By promptly monitoring and controlling noise levels, we can protect the environment and health, thereby creating a better living environment for future generations.

Next, adhering to the principle of value dynamism, we analyzed the core values of this product through user needs. In everyday learning, living, and working scenarios, people require a quiet environment. A lack of quiet can not only harm physical and mental health but also lead to disharmonious interpersonal relationships and disrupt social order. Therefore, the core values of this product are set as tranquility, harmony, and order, aiming to meet users' needs for a quiet, harmonious, and orderly environment through a series of functionalities.

Table 2. Decibel detection lamp's values turn into needs

Values
A peaceful, harmonious, orderly, and high-quality society (where everyone is in their place and fulfills their role)

Norms
In environments where a quiet living and working atmosphere is needed, people should be able to maintain tranquility and harmonious interpersonal relationships.

Needs
The functions of the decibel detection lamp include: Real-time detection of sound decibel levels Light activation when decibel levels exceed the standard value Beam directly locates and tracks the noise source Light turns off when the noise source stops emitting noise

Finally, we systematically evaluated the social impact of this product from the perspectives of "individual, society, and environment," following the principle of systematic consideration.

Table 3. The value impact of technology

	The Value Impact of Technology
Individuals	We collectively need to create a quiet, orderly, and high-quality living and working environment.

Society	Promoting social values of tranquility, harmony, and a society where everyone is in their place and fulfills their role.
Environment	Technology drives environmental protection.

After determining the overall approach to the product using the three principles of VSD, we began the product design with the three methods of VSD.

In the conceptual investigation phase, the core value of the noise decibel detection lamp is "tranquility." This value has a long-standing tradition, spanning Chinese philosophy, Greek philosophy, and philosophical therapy.

In Greek philosophy, the Epicurean school, the Stoic school, and Skepticism all pursued "tranquility" as the ideal state of life. Epicurus advocated dissolving worries with an optimistic and joyful attitude, achieving reconciliation with the world, guiding people towards a state of "tranquil happiness," ultimately reaching the highest ideal state of "a body without pain and a soul without disturbance," achieving personal inner harmony and tranquility. The Stoic school believed that the ultimate pursuit of life is happiness, which is not external glitter but stems from a "calm and orderly life," advocating a lifestyle of conformity to nature and rational control. Meanwhile, Skepticism viewed "tranquility" and "happiness" as two sides of the same coin. They believed that misfortune often arises from the mind being disturbed by dogmatic beliefs or prejudices, leading to inner turmoil and unrest. Therefore, Skepticism emphasized viewing intellectual activity as a unique way of life, dedicated to pursuing inner tranquility in beliefs and maintaining a moderate and measured experience in unavoidable life situations. This encourages people to examine their beliefs and seek inner peace and freedom through doubt and reflection.

In China, Laozi's concept of "tranquility" in the "Tao Te Ching" refers to both the ideal state of political governance—"governing without action"—and the state of personal cultivation—"attain utmost emptiness and guard steadfast tranquility." Firstly, Laozi criticized the "extravagant and chaotic" governance style of contemporary rulers and advocated "governing without action." "Without action" does not mean doing nothing but rather not intervening chaotically and governing according to natural laws and the people's state. In Chapter 37 of the "Tao Te Ching," Laozi mentioned: "If desires are absent, there will be tranquility, and the world will settle itself. The Dao always does nothing, yet everything is done. If lords and kings could keep it, everything would transform naturally." For rulers, Laozi suggested they should govern the country and the people as if guarding the "Dao." If they can adhere to this principle of tranquility and desirelessness, then all things will develop according to their nature and needs, and society will achieve a state of natural harmony, prosperity, and stability. Secondly, "tranquility" also refers to personal cultivation. In Chapter 16 of the "Tao Te Ching," it states: "Attain utmost emptiness; guard steadfast tranquility," allowing the mind to reach a natural state and firmly maintain this tranquility. "Tranquility" enables individuals to cultivate deeper inner qualities and wisdom, thereby finding more profound and lasting inner satisfaction. This way of life not only contributes to personal comprehensive development but also brings a more harmonious and stable atmosphere to society.

In the field of philosophical therapy, methods of tranquility can help individuals delve into their own thoughts and seek inner answers, thus healing the mind and body. Examples include the tranquility techniques used in children's philosophy and the practice of maintaining tranquility through philosophical walks.

Thus, the philosophical concept of tranquility primarily refers to a state of mental calmness, peaceful thoughts, and the absence of disturbances and entanglements. In the noisy and chaotic modern society, people yearn for tranquility to find inner peace and calm. Tranquility is also the primary value embedded in the noise decibel detection lamp.

In the technical investigation phase, hardware selection and software development are two key components. For hardware, a high-sensitivity microphone was chosen as the main sensor for sound collection to ensure accurate capture of environmental sound changes. Next, a microcontroller with strong processing capability (STC89C52RC) was selected as the core processing unit, chosen for its ease of programming, rich community support, and ability to efficiently process sound data and drive other modules. Additionally, considering that the noise detector might be used outdoors, a power management module was incorporated into the hardware design to ensure good battery life.

In terms of software development, the first step was to write a sound signal processing program capable of extracting useful noise information from the raw data collected by the microphone and converting it into decibel values. Subsequently, a user interface (UI) was developed to allow users to view real-time noise levels intuitively and provide functionality to adjust the sound threshold for the light to accommodate long-term noise monitoring.

Following the product design phase, we entered the product application and upgrade phase. During the application phase, we applied VSD's empirical investigation method to evaluate the social effects and user feedback of the product, continuing to assess the core values and technical functions of the product and formulate upgrade plans.

The author employed a semi-structured in-depth interview method to collect data and conducted qualitative thematic analysis. Stakeholders were categorized into 11 types based on four aspects: (1) by usage scenario: household users, workplace users, public place managers; (2) by needs: basic needs users, advanced function needs users; (3) by purchase motivation: safety-conscious users, compliance-driven users, technology enthusiasts or seekers; (4) by level of professional knowledge: ordinary users, professional users; (5) experts and scholars. From March 2024 to May 2024, researchers conducted approximately 15-minute interviews with 33 users of the noise decibel detection lamp using various methods, including face-to-face, phone, WeChat voice, and questionnaire surveys, and compiled an interview outline and record sheet.

User feedback collection revealed a high level of interest and demand for devices that can monitor environmental noise in real time and track the source of the noise. Users particularly appreciated the device's functionality for nighttime noise monitoring, as this is directly related to their sleep quality and daily comfort. Additionally, feedback highlighted a strong expectation for ease of

use and data accuracy, prompting the development team to focus more on the intuitiveness of the user interface and the precision of the sensors during the design process.

At the same time, the volunteer team conducted experiments with the noise decibel detection lamp in various settings including libraries, community centers, cafes, and classrooms. The experiments confirmed that the product performs as expected. From the perspective of social benefits, the deployment of the noise decibel detection lamp positively contributes to raising public awareness about noise pollution and upholding the value of tranquility. The tranquil environment and harmonious interpersonal relationships created by the device can enhance public well-being.

Based on the initial interview feedback and field testing, the study found that the noise decibel detection lamp could be further improved in the following two areas:

(1) Technical Adjustments: First, the next phase of software development should ensure data privacy and security, such as by implementing encryption techniques to protect user data and establishing user access controls to ensure that only authorized individuals can access sensitive information. Additionally, the product plans to enhance sensor sensitivity and add a light beam tracking feature, which would directly aim at the noise source to improve the product's accuracy.

(2) Incorporating New Value "Aesthetics": Upgrading the product's appearance from a linear to a streamlined design to add the value of "aesthetics" to the product.

5. Conclusion and Outlook—Empowering Technology with Values to Enhance Public Well-being

Although AIGC (Artificial Intelligence Generated Content) can produce a large volume of content, it lacks human innovation and unique creativity. Humans can generate new ideas, perspectives, and artistic works, which AI cannot fully replicate. For example, in fields like cultural creativity and design, AIGC can assist artists and designers in their creative processes, but true innovation still comes from human imagination and creativity. Additionally, artificial intelligence still has limitations in handling emotions and understanding human needs. Humans are capable of deeply understanding others' emotions, providing emotional support and humanistic care, which are crucial in many areas such as healthcare, education, and psychological counseling. Therefore, the authority to define social values remains in human hands.

Unlike machines, humans are sensitive to societal needs and can actively design value concepts to create new worlds. Therefore, we must maintain a motivation for learning and an open collaborative spirit, using science and technology to empower social development. One of the most famous quotes from the "Tao Te Ching" is: "The Tao that can be told is not the eternal Tao; the name that can be named is not the eternal name." This quote directly highlights the core of the "Tao Te Ching" in terms of ontology—the debate of being and non-being. What do being and non-being refer to? Non-being represents infinite possibilities and lacks specification; being represents concretization and has specificity. Non-being manifests as being, fundamentally rooted in non-being. The relationship between being and non-being is not one of separation but of unity. In the digital age, the relationship between humans and technology is akin to that of being and non-being. Humans are the foundation of infinite possibilities, while technology is an embodiment of human will, existing as one with humanity. Technology originates from human wisdom and serves humans, and under human guidance, it can play a positive social role.

The application of value-sensitive design (VSD) theory and methods in the noise decibel detection lamp has brought about positive social impacts. First, from a humanistic care perspective, it fully considers the diversity of user groups and noise tolerance in different environments, focusing on enhancing user experience. Through customized noise detection solutions, the introduction of environmental sensing technology, and user participation in the design process, the noise decibel detection lamp has not only improved its practicality and effectiveness but also greatly enhanced user satisfaction. Additionally, the effective management and control of noise pollution by this product has promoted attention to the special needs of sensitive areas, thereby improving the overall quality of life for the public. Moreover, the integration of human societal values such as "tranquility, harmony, and order" in the development of the noise decibel detection lamp has promoted the fusion of technology and social values, providing strong support for creating a harmonious and tranquil living environment, significantly enhancing social governance effectiveness and public well-being.

Currently, VSD is widely applied in various areas of public well-being, including urban and rural infrastructure construction, social security system development, public services, environmental protection, and resource utilization. In September 2023, General Secretary Xi Jinping proposed the concept of developing new quality productive forces. This new quality productive force is characterized by innovation leading the way, breaking away from traditional economic growth modes and productivity development paths, with features such as high technology, high efficiency, and high quality, in line with advanced productive force qualities of the new development philosophy. The development of new quality productive forces requires the inclusion of VSD methods, focusing on the values of the new development philosophy, addressing real human needs and user experiences, optimizing design and resource allocation, and promoting sustainable development. Therefore, value-sensitive design, as a technological approach, can enhance social governance effectiveness and public well-being. In the future, we should place greater emphasis on the application and promotion of value-sensitive design, contributing to the realization of a better, happier, and more harmonious society.

References

[1] Liu, Z., & Zhao, Y. (2023). Technical logic, implementation methods, and real-world boundaries: The profound impact of generative AI on the publishing industry. *China Publishing*, 15, 11-16.

[2] Chen, J. (2023). Principles of smart home design under traditional creation ethics. *Beauty and Times: Creativity (Part I)*, 2, 45-47.

[3] Zhang, W. (2023). *Intrinsic technology ethics research: Ethics and logic*. People's Publishing House.

[4] Ge, L., & Stock, J. (1999). Governance as theory: Five propositions. *International Social Sciences (Chinese Edition)*, 2.

[5] Liu, Y. (2023). *Introduction to technology governance*. Beijing: Peking University Press.

[6] Saraleah, F. (2020). Value sensitive design: Shaping technology with moral imagination. *Design and Culture*, 12(1), 109-111.