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# Ethical Dimensions and Legal Framework in Service Systems: Rights, Obligations, and Business Practices

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**Abstract:** This research analyzes the integration of ethical dimensions and legal frameworks within digital healthcare service delivery systems in the era of medical technology transformation. The research used a qualitative methodology with a case study design, performed in XXX City, and included 28 participants including healthcare staff, patients, system administrators, and health legislation specialists. Data was collected via in-depth interviews, focus group discussions, and non-participant observation, thereafter analyzed using thematic analysis. The theoretical foundation of the study is based on the integration of principlism theory, rights-based theory, the technology acceptance model, healthcare economics theory, and sustainable business model theory. The study's findings indicate that the implementation of digital health technology faces considerable challenges in balancing operational efficiency with the protection of patient rights. The findings identify five new dimensions of service provider obligations: digital competence, data management, digital communication, lifelong learning, and digital equity. An analysis of sustainable business methods reveals a tension between profitability, accessibility, and service quality. The research emphasizes the need to redefine patient rights in the digital age, create a comprehensive regulatory framework, and adopt a holistic approach to sustainability that includes the triple bottom line. In Indonesia, including multicultural perspectives, especially Islamic values via the concepts of maslaha and Maqasid Shariah, is essential for developing an ethical and sustainable digital health system.The five theoretical frameworks are integrated through a multi-layered analytical design: principlism provides the ethical foundation; rights-based theory establishes the legal basis for patient rights; TAM explains technology adoption behavior among healthcare providers; healthcare economics contextualizes structural constraints such as market failure and equity gaps; and sustainable business model theory ensures long-term operational viability. Islamic principles were operationalized by applying maslaha (public interest) as an evaluative lens when weighing trade-offs between efficiency and patient welfare, and Maqasid Shariah as a deductive coding framework across five objectives: protection of life, intellect, progeny, wealth, and dignity.

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## INTRODUCTION

Contemporary healthcare delivery systems face increasingly complex ethical and legal challenges in the era of digitalization and advanced technology. Kumar (2025) emphasizes that digital transformation in healthcare has intensified concerns about patient privacy and medical data protection, necessitating a comprehensive ethical framework to address the delicate relationship between medical technological advancements and the protection of patient rights. Healthcare providers face ethical dilemmas that include balancing operational efficiency, service accessibility, and the protection of sensitive patient information (Ibrahim et al., 2024; Williamson & Prybutok, 2024). The proliferation of artificial intelligence in medical diagnosis, telemedicine, and hospital management systems has created new dimensions of ethical complexity that go beyond traditional social responsibility frameworks in the healthcare sector, demanding innovative approaches to medical governance and professional accountability (Siala & Wang, 2022).

The framework for social responsibility in the healthcare sector has evolved by integrating diverse ethical perspectives, including religious and cultural principles that enrich the understanding of healthcare providers' moral obligations. Turker (2016) demonstrates that Islamic principles provide a strong theoretical foundation for social responsibility in healthcare, emphasizing patient well-being and equitable access as fundamental obligations aligned with the concept of maslaha (public interest) in Islamic law. This multicultural approach is reinforced by Abdullah (2025), who integrates motivation theory with the principles of Maqasid Shariah within the context of healthcare human resource management, creating a framework that values both international medical professional standards and local ethical values. The convergence of diverse ethical traditions within healthcare systems highlights the need for a more inclusive and culturally sensitive approach to medical care that goes beyond conventional biomedical models and acknowledges the spiritual and social dimensions of health and healing.

The use of artificial intelligence and digital health technology in medical care systems has made it necessary to construct organized ethical guidelines and extensive regulatory frameworks. Akramov (2024) contends that healthcare institutions need AI deployment techniques that include both diagnostic and therapeutic functionalities, with ethical issues in medical decision-making, including algorithmic openness and accountability in treatment recommendations. This complexity is compounded by concerns about dual-use technology in the medical field, as emphasized by Mehlich (2018), which highlights the importance of maintaining the integrity of medical research while addressing the risks of misuse of advanced health technology. Georgiadou (2021)adds an important dimension to multidimensional assessment for process improvement in healthcare systems, emphasizing the need for comprehensive evaluation tools that can measure effectiveness, safety, and ethics in the application of medical technology.

The main challenge lies in developing a governance structure that can balance medical innovation with patient protection, ensuring that advancements in health technology serve the best interests of patients and society as a whole. Responsible research and innovation approaches in the healthcare sector have become a fundamental framework for addressing the complex ethical challenges arising from the rapid development of medical technology and changing patient expectations. Gianni (2018) provides a theoretical framework for responsible medical research practices, emphasizing the importance of patient, family, and community involvement throughout the development of healthcare services, as well as the need for transparency in clinical trials and the implementation of new technologies.

This approach aligns with Sayles (2024) framework for AI governance in a medical context, which emphasizes the requirement of transparent, accountable, and auditable diagnostic and therapeutic AI systems to ensure patient safety and clinical effectiveness. This convergence of perspectives indicates that healthcare institutions must adopt a proactive approach to the development of medical technology, considering not only clinical effectiveness but also anticipating and addressing social, economic, and ethical impacts before widespread implementation, including considerations of equitable access and distributive justice in healthcare services.

The healthcare industry has shown distinctiveness in using a humanistic approach to social responsibility, offering a significant paradigm for the advancement of comprehensive ethical frameworks within public service systems. Ikejimba (2022) shows how a humanistic approach to healthcare may make

connections between healthcare practitioners, patients, and families more meaningful and improve the social legitimacy of medical institutions in the community. This sector-specific approach complements broader theoretical advancements in the economics of health social responsibility, as examined by Wagner-Tsukamoto (2019), who delineates the transition from conventional social responsibility frameworks to a more cohesive economic perspective that acknowledges the intricate interdependence among ethical practices in healthcare, financial viability, and public health outcomes.

This trend shows that healthcare systems need to use several theoretical points of view in their social responsibility practices to deal with problems that have many sides, such as making healthcare more accessible, affordable, and fair in how resources are distributed. Digital health platforms and telemedicine systems have established a novel framework for comprehending patient rights, provider responsibilities, and ethical business conduct within an ever-evolving digitalized and linked healthcare environment. Yasar (2025) provides an analytical framework for understanding the sharing economy in the context of healthcare, revealing the complex relationships between digital health platforms, patient engagement, and service provider responsibility in collaborative healthcare models involving multiple stakeholders. Tang (2024) addresses critical privacy protection challenges in open healthcare data systems and interoperability between medical institutions, proposing a framework that balances transparency for research and public health purposes with the protection of patients' personal medical information confidentiality. Furthermore, Akmal (2024) researched the dimensions of digital rights and empowerment in the context of healthcare service access, specifically analyzing how Islamic legal perspectives can provide ethical guidance to address gender disparities in access to health technology and telemedicine services. This development underscores the urgent need for healthcare systems to develop sophisticated approaches to medical digital ethics that address the diverse needs of patients, families, and communities while maintaining high clinical standards and operational effectiveness in an increasingly complex and integrated health technology environment.

This study identifies some fundamental issues in contemporary healthcare delivery systems that need more investigation due to complex ethical and legal challenges. There is an insufficient understanding of how to integrate the ethical dimensions of healthcare systems with existing legal frameworks. This is particularly pertinent for the respect for many cultural and religious perspectives while also maintaining universal medical standards. The use of digital technology and artificial intelligence in healthcare services generates novel ethical dilemmas that existing legislation does not fully address. This complicates the determination of legal and moral accountability in healthcare. Thirdly, there is an absence of clarity regarding the definition and implementation of patient rights in the context of healthcare digitalization, particularly concerning the safeguarding of patient data, obtaining digital informed consent, and ensuring equitable access to advanced healthcare technologies. Fourth, healthcare professionals in the era of telemedicine and digital health platforms struggle to reconcile traditional ethical standards with the practical implications of technology.

This might result in tensions between system efficiency and patient-centered treatment quality. The digital health sector requires an ethical framework that harmonizes economic sustainability with service accessibility. This is particularly significant for socioeconomic equity and the distribution of healthcare resources. In Indonesia, specific regulatory gaps identified in this study include: the absence of a standalone Digital Health Law addressing AI-assisted diagnosis and algorithmic accountability; gaps in the Personal Data Protection Law (UU PDP, 2022) regarding medical data processed by third-party AI vendors; and ambiguity in professional liability standards for errors produced by diagnostic AI tools. Patient rights in this study are understood as layered: core rights (right to health, privacy, and non-discrimination) are universal and grounded in international human rights law, while contextual rights (right to digital literacy support, algorithmic transparency, and offline service alternatives) are context-dependent and emerge from the specific challenges of digital healthcare in Indonesia. Concrete AI-related ethical dilemmas documented in this study include: an AI diagnostic tool flagging healthy patients as high-risk due to non-Indonesian training data; a telemedicine platform collecting symptom data without explicit consent for secondary commercial use; and an AI scheduling system that systematically deprioritized patients with limited digital access.

## THEORETICAL FRAMEWORK

The theoretical framework of this research is constructed through a multidisciplinary integration that amalgamates theories from medical ethics, health law, information technology, and health economics to furnish a thorough comprehension of the ethical and legal aspects within the healthcare service delivery system. This study is based on five key hypotheses that work together to deal with the problems that come up when medical equipment is digitalized. This study is grounded on the ethical framework of Principlism Theory in biomedical ethics, defined by Beauchamp and Childress in their foundational text "Principles of Biomedical Ethics," first released in 1979 and now in its eighth edition (Beauchamp & Childress, 2019). This approach is based on four basic ideas: autonomy (respecting the patient's right to make their own decisions), beneficence (doing good), non-maleficence (not injuring), and fairness. Beauchamp and Childress's four fundamental principles have become the most common way to teach and test medical ethical problems in healthcare (Page, 2012). In the digital era, the concept of autonomy includes patients' knowledge of their own data and AI, while the principle of justice looks at how equitable access to healthcare technology is. This paradigm provides an ethical basis for reconciling technological advancement with the safeguarding of patient rights.

This theoretical framework's legal aspect is based on rights-based theory, which says that the healthcare system is legitimate since it protects patients' basic rights. Human rights in patient care represent a reframing of international human rights law, as well as constitutional thought and tools, into a coherent approach aimed at the protection and promotion of personal and communal health (Peled-Raz, 2017). This theory integrates the international human rights framework with the national health law context, encompassing the right to health, the right to medical information, the right to privacy and confidentiality, and the right to equal access to services (WHO, 2023). The human right to health is a critical legal tool for achieving health justice, and universal health coverage is among the Sustainable Development Goals (Montel et al., 2022). In the digital age, rights-based theory accommodates digital rights, including the protection of medical data, transparency of AI algorithms, and equal access to healthcare technology. This theory outlines the evolution of digital service providers' obligations and serves as the legal basis for adapting traditional patient rights for the era of telemedicine.

The technological and digital aspects of the healthcare system are analyzed through the Technology Acceptance Model (TAM) developed by Davis (1989). TAM was initially derived from the Theory of Reasoned Action (TRA) and has become the most widely applied model for user acceptance and use of technology (Holden & Karsh, 2010). This model is based on two main factors: perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness is defined as the extent to which a person believes that using a particular system will improve their job performance, while perceived ease of use is defined as the extent to which a person believes that using a particular system will be free of effort (Davis, 1989). TAM has become a primary model for analyzing the adoption of information technology in healthcare systems (Garavand et al., 2016). This model provides a framework for integrating service provider obligations with the operational realities of technology, as well as analyzing the influence of social, cultural, and economic factors on the acceptance of health technology. It is acknowledged that TAM was not originally designed to measure ethical conduct directly.

In this study, TAM is applied as an explanatory lens: when healthcare providers perceive ethical compliance tools (e.g., digital consent forms, data encryption interfaces) as difficult to use, adoption falls — thereby undermining ethical obligations in practice. TAM thus functions as a behavioral mediator between ethical frameworks and their practical implementation, not as an ethical evaluator per se. When conflicts arise between principlism and rights-based approaches — for example, between patient autonomy and the systemic duty to ensure equitable access — this study applies a contextual priority hierarchy: non-maleficence and patient safety take precedence, followed by rights-based obligations for systemic equity, with principlist autonomy foregrounded in individual clinical decisions. The sustainability framework

integrates all three Triple Bottom Line dimensions: economic viability, social equity, and environmental responsibility (Vergunst et al., 2020).

The economic dimension in healthcare is analyzed through healthcare economics theory, which integrates market failure theory, public goods theory, and health equity theory to understand the economic dynamics in the provision of digital healthcare services. Kenneth Arrow's seminal paper on "Uncertainty and the Welfare Economics of Medical Care," published in 1963, laid the foundation for the discipline of health economics by identifying the unique characteristics of healthcare service markets (Arrow, 1978). Healthcare can be considered a typical example of 'market failure' in economic theory from both the demand and supply sides, as patients cannot be considered ordinary consumers shopping for the best deals because they cannot be fully informed about healthcare services (Garattini & Padula, 2019). Market failure theory explains why healthcare markets cannot achieve optimal resource allocation without intervention, particularly in the context of expensive and complex health technology. Health equity theory provides a framework for analyzing the distribution of benefits and burdens in the implementation of health technology, as well as identifying factors that contribute to health disparities in the digital age. This theory serves as the foundation for understanding the economic trade-offs between technological efficiency and equity in service access, as well as for analyzing the financial sustainability of digital healthcare service models that prioritize social impact.

Sustainable Business Model Theory integrates the triple bottom line concept (profit, people, planet) developed by (Elkington, 2018) to measure organizational performance from financial, social, and environmental aspects (Savitz, 2013). In healthcare, TBL encompasses economic sustainability, access equity, and carbon footprint reduction (Vergunst et al., 2020). This theory analyzes the creation of shared value that integrates economic and social value for various stakeholders in the digital health ecosystem

## METHODS

This research utilizes a qualitative methodology with a case study framework to thoroughly examine the ethical considerations and legal structures in digital healthcare delivery systems. The qualitative method was selected for its capacity to provide a comprehensive examination of the experiences and viewpoints of diverse stakeholders confronting the obstacles associated with health technology adoption (Creswell & Creswell, 2017; Creswell & Poth, 2016). The case study approach facilitates an in-depth examination of current phenomena within real-world situations, especially when the delineation between the phenomenon and the environment is ambiguous. The study was carried out in XXX City, which encompasses many tiers of healthcare services, including regional public hospitals, private hospitals, and community health clinics that have used digital health technologies.

The choice of this site is based on differences in the types of technology utilized, the types of patients serviced, and the difficulty of the healthcare services offered. Integrating digital technology with traditional medical procedures is different in each place because of the obstacles and situations that are unique to each place. Participants in the research were chosen using purposive sampling methods, requiring a minimum of one year of direct involvement with digital health technologies and a readiness to candidly communicate their experiences. There are 28 people taking part in the study. They include 12 healthcare professionals (doctors, nurses, and pharmacists), 8 patients and family members from different demographic groups, 5 administrators and managers of the healthcare system, and 3 experts, such as a bioethics expert, a healthcare law practitioner, and a representative from the XXX City Health Department. According to the criteria of adequacy and appropriateness in qualitative research, this number of participants is enough to reach data saturation. The data collection was carried out using semi-structured in-depth interviews.

The interview guide was constructed in accordance with the research's theoretical framework, emphasizing experiences with digital health technology, ethical dilemmas encountered, comprehension of rights and responsibilities in the digital realm, and viewpoints about current laws. Along with individual interviews, there were also focus group conversations with four groups of stakeholders who were all the

same. This was done to help each group talk more deeply about problems that were important to them. Non-participant observation was used at all three study sites to comprehend the real practices of technology utilization and the relationships among stakeholders. The examination of policy papers, standard operating procedures, and recommendations for the deployment of digital health technologies also added to the data. Thematic analysis, based on the work of Braun and Clarke (2023), was used to analyze the data. This started with a phase of getting to know the data by reading the whole interview transcripts over and again. The coding procedure was conducted methodically, using both a deductive approach grounded in a theoretical framework and an inductive approach derived from the field data. The NVivo 12 software makes it easier to code and sort data. The primary themes were discerned via an iterative process characterized by rigorous debates within the research team to ascertain the relevance and importance of each issue. Cross-case analysis was performed to discern patterns of similarities and variances across study locations, along with contextual variables affecting technology installation.

Data validity was guaranteed through source triangulation by gathering information from diverse stakeholders with varying perspectives, method triangulation by integrating interviews, focus group discussions, observations, and document analysis, and member checking by validating preliminary interpretations with principal participants. Peer debriefing with specialists in health ethics and qualitative technique enhances credibility. A comprehensive description of the study setting and the participants' traits keeps transferability intact. A full audit trail and testing for consistency make sure that reliability is high. Confirmability is preserved by a reflexivity journal to record any researcher bias and external auditing by an impartial expert. The whole study procedure was done in full accordance with ethical research standards. All participants gave their informed verbal agreement after being fully informed about the study's aim, methods, and their freedom to leave at any time without penalty. We make sure that participants' privacy and anonymity are protected by using fake names in all documents and publications and by getting rid of any information that may identify them. The research team is the only one who can access the study data, which is kept safe. Participation is optional, and no monetary incentive is offered to prevent compulsion. In return, a summary of the study results will be sent to the institutions who took part so they may utilize it to make their systems better

## RESULTS AND DISCUSSION

### Integrating Ethical Dimensions and Legal Frameworks in the Era of Healthcare Servic

Digitalization Digital transformation in healthcare services has created new complexities in integrating ethical dimensions with applicable legal frameworks. Based on findings from in-depth interviews with various stakeholders in XXX City, it was revealed that the implementation of digital health technology faces fundamental challenges in balancing operational efficiency with the protection of patient rights.

Dr. A, an internal medicine specialist at RSAA, revealed in an interview, *"We face a dilemma every day. On one hand, technology like electronic health records is very helpful for service efficiency, but on the other hand, we are concerned about patient data privacy. Often, existing regulations do not yet accommodate the technological realities we use.*

This finding aligns with Kumar (2025) and Naamati-Schneider et al. (2024) argument, which emphasizes that digital transformation in healthcare has intensified patient privacy concerns and necessitates a comprehensive ethical framework. Data analysis shows that 78% of healthcare providers experienced confusion in interpreting their ethical obligations when using digital systems, particularly regarding informed consent and data protection.

**Table 1. Challenges of Ethical-Legal Integration in Healthcare Technology**

| Aspect | Primary Challenge | Frequency Mentioned | Impact on Service |
|---|---|---|---|
| Data Privacy | Regulatory ambiguity | 85% | High |
| Digital Informed Consent | Process complexity | 72% | Medium |
| Equitable Access | Technology gap | 68% | High |
| Algorithm Transparency | Lack of understanding | 61% | Medium |
| Accountability | Responsibility ambiguity | 79% | High |

*Source: Processed Data, 2024*

Prof. Dr. B, a bioethics expert from XXX University, explains, *"What's fascinating is how local cultural perspectives, including Islamic values, can be integrated with universal medical ethics standards. The concept of maslaha, or benefit, in Islam is relevant when evaluating the benefits versus risks of new healthcare technologies."*

This multicultural integration perspective is supported by Abdullah (2025); Abdullah et al. (2025) and Azmin Shompa et al. (2024) findings, which demonstrate how Maqasid Shariah principles can be integrated into healthcare human resource management. In the context of XXX City, which has a Muslim majority population, this approach shows significant relevance.

**Implementation of AI and Legal-Ethical Implications in Medical Practice**

The use of artificial intelligence in diagnosis and treatment has created a new paradigm in medical professional responsibility. Research findings show that AI diagnostic implementation in three hospitals in XXX City faces serious challenges regarding transparency and accountability.

Dr. B, Medical Director of RSBB Hospital, states, *"When an AI system provides diagnostic recommendations, who is responsible if an error occurs? Is it the doctor using the system, the algorithm developer, or the institution implementing it? Current regulations don't provide clarity."*

This statement echoes Akramov (2024); Esmaeilzadeh (2024) and Nair et al., (2024) concerns about the need for structured AI implementation strategies in corporations, including healthcare institutions. Analysis shows that 83% of doctors using diagnostic AI feel they lack sufficient understanding of how the algorithms they use actually work.

Mr. CC, a health law expert from YYY University, adds, *"From a legal perspective, we're facing a serious regulatory vacuum. Traditional medical malpractice law isn't sufficient to handle cases involving AI. We need a new legal framework that can accommodate the complexity of this technology."*

These findings align with Kiseleva et al. (2022); Sayles (2024) and Zhang & Zhang, (2023) framework for AI governance in medical contexts, which emphasizes that there must be transparency and accountability in diagnostic AI systems.

**Redefining Patient Rights in the Digital Era**

The digitalization of healthcare services has fundamentally transformed how we understand and implement patient rights. Research findings indicate that traditional concepts of informed consent, privacy, and service access require redefinition in the digital context.

Mrs. E, a patient who actively uses telemedicine, shares her experience: *"I feel confused about my rights when using online consultation apps. Is my data secure? What should I do if a misdiagnosis occurs during a video call? The information about the situation isn't clear."*

The majority of interviewed patients express similar experiences, revealing a significant gap in understanding their rights in the digital context. Ibrahim et al. (2024); Tang, (2024) and Williamson & Prybutok (2024) underscores the significance of privacy protection frameworks that can strike a balance between transparency and the confidentiality of personal medical information.

**Table 2. Evolution of Patient Rights in the Digital Era**

| Traditional Rights | Digital Adaptation | Implementation Challenges |
|---|---|---|
| Informed Consent | Digital Consent Management | Technical complexity, patient understanding |
| Medical Privacy | Data Protection Framework | Interoperability, cybersecurity |
| Service Access | Digital Equity | Technology gap, digital literacy |
| Transparency | Algorithm Explainability | AI complexity, technical language |
| Patient Autonomy | Digital Autonomy | Algorithm manipulation, filter bubbles |

*Source: Processed Data, 2024*

Dr. H, head of the telemedicine unit at RSH Hospital, explains: *"We need to develop new protocols for digital informed consent. It's not enough to just provide consent checkboxes – patients must truly understand the implications of the digital services they're using".*

These findings are supported by Abdelwahed et al. (2024); Akmal (2024) and Nascimento et al., 2025) framework on digital rights and empowerment, which analyzes how Islamic legal perspectives can provide guidance for addressing gender gaps in healthcare technology access.

**Obligations of Service Providers in Digital Health Platforms**

The transformation from face-to-face services to digital platforms has fundamentally changed the spectrum of obligations for healthcare service providers. Data analysis shows that service providers face complex challenges in integrating traditional ethical standards with the operational realities of continuously evolving digital technology.

Prof. F from XXX University states: *"Obligations in telemedicine are not the same as conventional services. How do we ensure the quality of physical examinations through video calls? How do we address technological limitations without reducing established medical service standards?"*

The research identifies five dimensions of new obligations emerging in the digital era, each with unique complexity and implementation challenges:

***Digital Competency Obligations***

Healthcare providers have a fundamental obligation to master the technology they use, not only from operational aspects but also deep understanding of associated limitations and risks. Dr. Agus Prasetyo, a doctor active in telemedicine at RSUD DDD, reveals: *"It's not enough to just be able to use online consultation apps, but we must understand technological limitations and when to refer patients for direct examination. We're often faced with situations where clinical signs cannot be assessed optimally through video calls".*

Research findings show that 72% of healthcare providers experience technological anxiety when first using digital systems, and 58% of them report that lack of formal training is the main barrier to providing optimal services. Dr. SI, a senior nurse at RS FFF, adds: *"We often feel unconfident when using new systems because we're afraid of making mistakes that could harm patients. There needs to be standardization of digital competencies for healthcare workers".*

Digital competency obligations also include the obligation to understand the ethical implications of every technology used. Interview results with 18 healthcare workers show that only 34% feel confident in explaining to patients how the diagnostic technology they use works, particularly AI-based systems.

***Data Management Obligations***

The obligation to manage patient data responsibly has expanded far beyond traditional medical records, encompassing digital footprints, metadata, and data interoperability between systems. Findings

show that 65% of service providers lack comprehensive understanding of patient data journeys in the digital systems they use.

Mr. HY, IT Manager at RS YYY, explains: *"Many doctors and nurses don't realize that every click in the electronic system creates a data trail that can be analyzed. They focus on clinical data but don't understand that behavioral data from system usage also becomes part of patient information that must be protected".*

The complexity of data management obligations increases with the need to share data with insurance systems, regulators, and research institutions. Dr. LM, head of the telemedicine unit at RS YYY, expresses her concerns: *"We're often asked to share patient data for various purposes, but the consent we obtain from patients doesn't specifically cover secondary use of this data. This creates a quite concerning gray area."* The research also identifies that 78% of healthcare institutions don't yet have comprehensive data governance frameworks, resulting in inconsistencies in patient data management across departments and systems.

***Digital Communication Obligations***

Digital platforms require communication skills that are fundamentally different from traditional face-to-face interactions. Analysis of 150 video consultation sessions shows that 43% of doctor-patient interactions in telemedicine experience miscommunication that potentially affects diagnosis quality and treatment compliance.

Dr. BS, who has conducted over 500 telemedicine consultations, shares his experience: *"Non-verbal communication, which is crucial in medical practice, becomes limited in video calls. I often struggle to assess patient anxiety levels or detect subtle signs that are usually easily visible in direct consultations. This forces me to develop more explicit verbal communication techniques".*

Digital communication challenges also include cultural and language barriers, especially when serving elderly patients or those with limited digital literacy. Mrs. Ros, a 67-year-old patient, expresses her difficulties: *"I'm often confused by the terms doctors use through video calls, and I'm embarrassed to ask repeatedly because unstable internet connections make conversations choppy."*

Digital communication obligations also include ensuring privacy and confidentiality during digital communications, which are often conducted in uncontrolled environments like patient homes or doctor workspaces (Abdelwahed et al., 2024; Alotaibi et al., n.d.; Nascimento et al., 2025).

***Continuous Learning Obligations***

Rapid developments in health technology create unprecedented obligations to continuously update digital knowledge and skills. Dr. MS, a pediatric specialist using diagnostic AI for pediatric radiology, explains: *"Every algorithm update potentially changes how we interpret imaging results. We must always follow these developments, but often updates are made without adequate training for end users. This creates risks for patient safety."*

Continuous learning obligations in digital health contexts include not only technical skills but also ethical reasoning, legal compliance, and cultural sensitivity in using technology. Prof. Dr. AR emphasizes: *"Traditional medical education doesn't adequately prepare healthcare workers for rapid technological changes like today. We need a paradigm shift from one-time education to a lifelong learning ecosystem."*

Research findings show that 84% of healthcare providers feel overwhelmed by the pace of technological change, and 67% report not having adequate time for learning activities amid high workloads. Dr. AK, a general practitioner at Puskesmas YYY, reveals: *"We want to continue learning about new technology, but with high patient loads and administrative duties, it's hard to find enough time. There needs to be a systematic approach to continuing education."*

***Digital Justice Obligations***

The obligation to ensure digital service accessibility for all patients, regardless of their technological literacy, economic status, or geographical location, becomes one of the biggest ethical challenges in the digital health era. Digital justice obligations include not only technical accessibility but also cultural appropriateness and affordability of digital services.

Dr. RS, who manages telemedicine programs for remote areas in Riau, reveals: *"We're often faced with a dilemma: whether to provide digital services that might not be optimal for patients with technological limitations, or ask them to come directly which might be difficult due to distance and transportation costs. Both have complex ethical implications."*

Digital justice obligations also include obligations to address algorithmic bias that can affect care quality for different demographic groups. Analysis results of diagnostic AI tools used in three hospitals show that 71% of algorithms haven't been adequately validated for local populations, potentially creating gaps in diagnostic accuracy.

Mr. DP, CEO of a digital health startup, explains the challenge from a business perspective: *"To create truly equitable digital health services, we must invest in expensive infrastructure and education, but the demographic groups most needing equity are those with the least ability to pay. This creates significant sustainable business model challenges."*

**Table 3. Implementation Complexity of Five Digital Obligation Dimensions**

| Obligation Dimension | Difficulty Level* | Key Stakeholders | Main Barriers | Implementation Time |
|---|---|---|---|---|
| Digital Competency | 7.2/10 | Individual service providers | Lack of training, resistance | 6-12 months |
| Data Management | 8.5/10 | Institutional | Regulatory gaps, technology complexity | 12-24 months |
| Digital Communication | 6.8/10 | Provider-patient | Cultural barriers, technology limitations | 3-6 months |
| Continuous Learning | 9.1/10 | Education system | Resource limitations, time | Ongoing process |
| Digital Justice | 9.3/10 | Multi-stakeholder | Economics, infrastructure | 24-36 months |

*Based on assessment of 28 research participants

These five dimensions of obligation don't stand alone but are interconnected and require an integrated approach in implementation. Concrete field evidence for each dimension includes: (1) Digital Competency: Dr. HN reported: "I was not trained to interpret confidence intervals from AI diagnostic tools; when the system indicated 67% malignancy likelihood, I did not know how to communicate that uncertainty to the patient." (2) Data Management: a system administrator disclosed that patient EHR data was automatically shared with a third-party analytics vendor without explicit processing agreements. (3) Digital Communication: observation at Clinic C showed 6 of 10 telemedicine sessions involved patients unable to adequately describe symptoms via video, a gap absent in face-to-face consultations. (4) Continuous Learning: 84% of providers felt overwhelmed by technology update pace; 67% lacked adequate time for learning amid high workloads. (5) Digital Justice: 71% of diagnostic AI tools used across the three hospitals had not been validated for Indonesian population data, creating documented accuracy gaps for local demographic groups. Dr. SA emphasizes: *"We can't address one dimension without considering the others. Digital competency without understanding justice implications will create new gaps. Data management without continuous learning will quickly become obsolete."*

The main challenge in implementing these five dimensions is the absence of comprehensive regulatory frameworks that can provide clear guidance for healthcare service providers. Mr. HY, a health law expert, explains: *"Current medical malpractice laws and professional standards haven't fully adapted*

*to digital health realities. We need legal frameworks that can balance innovation with patient protection while providing certainty for healthcare service providers."*

**Sustainable Business Practices in the Digital Health Sector**

Economic sustainability in the digital health sector faces tensions between profitability, accessibility, and service quality. Research findings show that traditional healthcare business models are not fully applicable in the digital context.

Mr. DP, CEO of a digital health startup in Pekanbaru, reveals: *"We face a paradox: to provide accessible and affordable services, we need a large user volume. But scaling up often potentially sacrifices individual service quality."*

Analysis of three digital health business models in XXX City shows a consistent pattern:

**Table 4. Digital Health Business Model Analysis**

| Business Model | Advantages | Challenges | Sustainability Score* |
|---|---|---|---|
| Freemium | High accessibility | Limited monetization | 6.2/10 |
| Subscription | Predictable revenue | Barrier for low-income | 7.8/10 |
| Pay-per-service | Flexibility | Unpredictable demand | 5.9/10 |
| B2B Partnership | Stable income | Dependency risk | 8.1/10 |

*Based on triple bottom line analysis: profit, people, planet

These findings resonate with (Hajli et al. (2025); Khodayari et al. (2025) & Yasar (2025) framework on sharing economy in healthcare service contexts, which reveals the complexity of relationships between digital platforms and service provider responsibilities. Dr. RS, director of a clinic chain implementing a fully digital system, explains: *"Sustainability isn't just about profit, but also the environmental impact of digital infrastructure and social impact on community healthcare access. We must think holistically."*

## CONCLUSION

This study elucidates the intricacies of amalgamating ethical considerations and legal structures in systems for providing digital healthcare services that need interdisciplinary and comprehensive methodologies. Digital revolution has established a novel framework for comprehending patient rights, service provider responsibilities, and sustainable business practices that existing regulatory frameworks are unable to address. The five recognized elements of digital obligation-digital competence, data management, digital communication, continuous learning, and digital justice-illustrate a fundamental change in medical professional duty that need standardization and methodical execution. The reframing of patient rights in the digital environment includes data protection, algorithm transparency, and digital equality. These changes need a complete rethinking of old ideas about informed consent, medical privacy, and access to services. Specifically, four patient rights require redefinition in the digital health context: (1) Privacy must be expanded to include data sovereignty over AI-processed health records; (2) Informed Consent must encompass disclosure of AI involvement in diagnosis, including algorithmic uncertainty; (3) Equitable Access must guarantee the right to non-digital alternatives for patients with limited digital literacy; (4) Algorithmic Transparency: a right largely absent from Indonesian law: entitles patients to understand how AI tools affect their care. Sustainable business model study shows that sustainability in the digital health industry includes not only economic viability but also social and environmental effects, in line with triple bottom line principles. The incorporation of multicultural viewpoints, especially Islamic principles via the notions of maslaha and Maqasid Shariah, greatly enhances the formulation of culturally attuned ethical frameworks while maintaining universal medical norms. This study finds that in order for digital health technology to operate, we need to create flexible regulatory frameworks that can keep up with new technologies while also protecting patients, making sure everyone has equal access, and making sure the

healthcare system lasts for a long time. Regarding environmental sustainability, three key concerns were identified: first, the significant energy consumption of cloud-based digital health infrastructure contributes to carbon emissions yet is rarely factored into sustainability assessments; second, the rapid obsolescence of diagnostic devices at study sites generates e-waste that none of the facilities managed through formal recycling channels; third, while EHR adoption reduced paper use, the carbon footprint of server infrastructure was systematically overlooked. Future regulatory frameworks should explicitly incorporate environmental impact assessments as part of digital health sustainability standards.

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