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Beyond the clinic: Ethical and managerial challenges of AI adoption in small-state health systems

Más allá de la clínica: desafíos éticos y de gestión de la adopción de IA en sistemas de salud de estados pequeños

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Abstract

The rapid integration of Artificial Intelligence (AI) into healthcare has generated significant global debate on its benefits, risks, and ethical implications. While much of this discourse centres on technological performance and clinical outcomes, far less attention has been paid to the managerial and governance challenges regarding AI adoption, particularly in small states with constrained resources. This paper takes Trinidad and Tobago as an illustrative example to explore the dual nature of AI in healthcare, both as an ethical and a managerial issue. Drawing on initiatives such as robotics, oncological diagnostics, and e-health platforms, the paper examines how external factors, including workforce competence, administrative capacity, leadership, cultural trust, and institutional governance, shape AI adoption outcomes. Ethical pillars, autonomy, beneficence, non-maleficence, and justice, are mapped onto managerial concerns such as risk management, strategic alignment, stakeholder trust, and resource allocation. We propose an integrated framework of policy and organisational recommendations, strengthening regulatory frameworks, building workforce competence, institutionalising audits, incentivising responsible practices, and ensuring transparency. By bridging ethics and management, the paper positions small states not as peripheral actors but as examples of how to enact responsible

Resumen

La rápida integración de la inteligencia artificial (IA) en la atención médica ha generado un importante debate global sobre sus beneficios, riesgos e implicaciones éticas. Si bien gran parte de este discurso se centra en el rendimiento tecnológico y los resultados clínicos, se ha prestado mucha menos atención a los desafíos de gestión y gobernanza que plantea la adopción de la IA, especialmente en Estados pequeños con recursos limitados. Este documento utiliza a Trinidad y Tobago como ejemplo ilustrativo para explorar la doble naturaleza de la IA en la atención médica, como un problema tanto ético como de gestión. Basándose en iniciativas como la robótica, el diagnóstico oncológico y las plataformas de salud digital, el documento examina cómo factores externos, como la competencia laboral, la capacidad administrativa, el liderazgo, la confianza cultural y la gobernanza institucional, influyen en los resultados de la adopción. Los pilares éticos, la autonomía, la beneficencia, la no maleficencia y la justicia, se vinculan con preocupaciones de gestión como la gestión de riesgos, la alineación estratégica, la confianza de las partes interesadas y la asignación de recursos. Proponemos un marco integrado de recomendaciones políticas y organizativas, que fortalezca los marcos regulatorios, fomente la competencia laboral, institucionalice las auditorías, incentive prácticas responsables y garantice la transparencia. Al conectar la ética con

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AI governance through globally relevant lessons regarding digital transformation in healthcare and beyond.

Keywords: Artificial intelligence in healthcare, ethics and governance, managerial challenges, small-state health systems, responsible AI adoption.

la gestión, el artículo posiciona a los pequeños Estados no como actores secundarios, sino como ejemplos de cómo implementar una gobernanza responsable de la IA mediante lecciones relevantes a nivel mundial para la transformación digital en la atención médica y otros ámbitos.

Palabras clave: inteligencia artificial en la atención médica, ética y gobernanza, desafíos de gestión, sistemas de salud en pequeños Estados, adopción responsable de la IA.

Introduction

Background

The rapid advancement of Artificial Intelligence (AI) in healthcare has prompted wide-ranging debates on its ethical, social, and policy implications. While much of the global discourse emphasises AI's technical and clinical benefits, ranging from enhanced diagnostics to streamlined administrative workflows (Alhur, 2024; Jha & Topol, 2016), less attention has been given to the managerial and governance challenges involved in integrating AI systems within small-state contexts. In countries such as Trinidad and Tobago, where resource constraints, institutional gaps, and socio-cultural dynamics play a defining role in healthcare delivery, the introduction of AI must be examined not only through ethical lenses but also through managerial and organisational perspectives (Gillies & Smith, 2022; Laï et al., 2020).

Healthcare is both a clinical and a managerial enterprise: decisions regarding technology adoption require strategic alignment with health system goals, leadership to guide organisational change, and governance mechanisms to ensure accountability (Catalina et al., 2023; Shinners et al., 2020). Thus, the conversation cannot remain confined to bioethics; it must also encompass leadership capacity, institutional preparedness, workforce competence, and cultural trust. These dimensions highlight why the AI debate in healthcare, while deeply ethical, is also fundamentally a management problem (Beauchamp & Childress, 1979; Char et al., 2018).

Trinidad and Tobago provides an illustrative example. The country has taken notable steps towards introducing AI through robotics in hospitals, associations for training public servants, and digitising patient care (Ministry of Public Administration, 2024). Yet these initiatives occur without a national ethics policy, leaving implementation fragmented and vulnerable to risks such as data breaches, inequitable access, and diminished patient trust (Johnson, 2019; World Health Organisation [WHO], 2021). While institutions such as the Caribbean Public Health Agency (CARPHA) and Regional Health Authorities (RHAs) manage ethics at the organisational level, no unified, national framework for AI use exists. This gap raises important questions for policymakers and managers: How should leaders in small developing states structure AI governance? What managerial practices ensure that AI deployment balances efficiency with equity? And what organisational frameworks are required to navigate the tensions among innovation, regulation, and ethics? Addressing these questions is consequential above and beyond healthcare. They illuminate broader management challenges accompanying digital transformation in small, resource-limited contexts (Bahaw et al., 2025; Fast & Horvitz, 2016; Sookhai, 2024). Therefore, the lessons derived from Trinidad and Tobago's health sector are transferable to other public administration and business management domains, mainly where organisations operate under constraints of scale, capacity, and trust.

Accordingly, this paper fills two primary gaps. First, it addresses the absence of a national ethics policy by proposing a broad framework for guiding AI systems in the Trinidad and Tobago health sector. Second, it introduces an explicitly managerial conversation concerning emerging technologies, emphasising governance,

leadership, and organisational change along with bioethical principles. By bridging ethics and management, we demonstrate how small states can adopt AI responsibly while building organisational resilience and leadership capacity. Specifically, this study (a) discusses three national initiatives, robot automation, oncological diagnostic testing and treatment, and e-health platforms, that exemplify Trinidad and Tobago's efforts to modernise healthcare; (b) examines external factors such as workforce competence, administrative capacity, leadership, and cultural trust, which shape how AI adoption unfolds beyond the technical domain; and (c) provides guidelines for managers, healthcare stakeholders, and policymakers to address the ethical and organisational challenges of AI integration. Through these aims, the paper contributes to research on the ethical implications of AI in health and the broader field of management studies by using Trinidad and Tobago's healthcare system as an illustrative example to explore managerial and ethical dynamics of AI adoption in small-state contexts.

National initiatives

Robotics in healthcare

In August 2024, the Ministry of Health in Trinidad and Tobago acquired and distributed eight health service robots (HSRs) across the public health system. By automating routine functions, the goal was to allow healthcare workers to focus on more critical patient care tasks (Ministry of Health, 2024). While this development signals progress in digital transformation, it raises significant ethical and managerial questions. From a moral standpoint, concerns include handling sensitive patient data collected by HSRs, potential privacy breaches, and accountability when errors occur (Gillies & Smith, 2022). From a managerial perspective, deploying robotics requires leadership to anticipate workforce resistance, redesign workflows, and ensure adequate staff training. Without such leadership, employee mistrust, patient scepticism, and unclear chains of responsibility offset the benefits of efficiency and error reduction. In management terms, robotics adoption can be understood through change management theory, which highlights the importance of communication, stakeholder engagement, and clear role definitions when organisations transform (Kotter, 1996). For small states such as Trinidad and Tobago, where healthcare systems are already strained, these management processes are critical to achieving the intended benefits of robotics while safeguarding equity and trust. Evidence from other contexts has shown that robotic process automation in healthcare can reduce medical errors and intensify ethical dilemmas regarding accountability and transparency (Sætra & Danaher, 2022).

Training and capacity building

Since 2023, the Ministry of Public Administration of Trinidad and Tobago has partnered with the Ministry of Foreign Affairs of Singapore to offer a five-day training programme on Transforming Public Service with the Power of Artificial Intelligence. Sponsored by the Singapore Cooperation Programme, this initiative exposes managerial-level government officials to the best practices in AI implementation (Ministry of Public Administration, 2024). While the programme represents an important step in capacity building, its effectiveness depends on institutional absorption capacity and the local system's ability to translate knowledge into practice (Laï et al., 2020). Training programmes risk becoming symbolic exercises unless managers return with clear pathways to apply what they have learned within local contexts. Furthermore, leadership commitment and organisational support structures are required to institutionalise new skills and knowledge. From a management perspective, this initiative highlights the principle of strategic alignment. AI training must not be pursued as a one-off exercise but integrated into broader organisational strategies for digital transformation. In small states, where human resource constraints are acute, aligning training with strategic objectives ensures that limited resources produce meaningful, long-term impact (Albaladejo-González et al., 2024).

E-Health platforms and oncology AI tools

Trinidad and Tobago has also explored AI applications in oncological diagnostics and e-health platforms, which facilitate remote access to patient records, telemedicine, and integrated treatment planning. These initiatives have the potential to enhance efficiency and expand access to care; however, their success hinges on technical infrastructure and organisational governance. Ethically, concerns centre on patient autonomy, informed consent, and data security (Beauchamp & Childress, 1979). Managerially, the focus shifts to institutional readiness: do RHAs and hospitals have the administrative and technical capacity to securely manage large volumes of digital health data? Can leaders build public trust in e-health platforms in a society where digital literacy and infrastructure vary widely? Studies in other countries demonstrate the promise and challenges of e-health systems (Blease, 2024). For instance, ORA platforms in the UK and USA have improved patient access but also raised risks of privacy breaches and reduced clinician-patient trust (Blease, 2024). Similarly, oncology-focused AI tools can improve diagnostic accuracy but require strong governance frameworks to ensure equitable access and accountability (Johnson, 2019). These questions present the dual role of ethics and management. E-health adoption must address the ethical imperative of protecting patient privacy while also requiring effective leadership, regulatory oversight, and workforce training. Without these managerial underpinnings, technology risks exacerbating inequalities rather than bridging them (Shinners et al., 2020).

Ethical considerations in AI adoption

The increasing use of AI in medicine brings several ethical challenges that must be anticipated prior to full-scale implementation. These challenges are not confined to the clinical domain; they extend into healthcare delivery's managerial and organisational dimensions. Therefore, any national ethics framework must be designed not only to respond to the evolving tools and technologies that constitute AI in medicine but also to guide decision-making, accountability, and organisational governance (Bahaw et al., 2025; Char et al., 2018; WHO, 2021).

Tools and applications: Ethical and managerial dimensions

A variety of AI tools are now being used in clinical medicine. Among them are:

- *Large Language Models* (LLMs) such as GPT-4 (OpenAI), Gemini (Google), and Bing AI (Microsoft) are applied to diagnosis, mental health counselling, patient intake, and even procedural consent (Bhaskar & Gupta, 2024).
- *Online Record Access* (ORA) systems, where patient notes are digitised and stored securely for patient and physician access, are now mandated in countries such as the United States and the United Kingdom (Blease, 2024).
- *Oncological AI diagnostics and e-health platforms* expand the scope of treatment access and continuity of care (Johnson, 2019).
- Ethically, these tools raise questions about autonomy, informed consent, confidentiality, and justice. Managerially, they demand robust governance structures in order to ensure accuracy, accountability, and trust (Gillies & Smith, 2022). For instance, delegating procedural consent to an LLM raises ethical concerns about accuracy and patient autonomy, and organisational concerns about liability: who is responsible if misinformation leads to patient harm? These overlapping ethical and managerial dilemmas reinforce the need for integrated frameworks (Shinners et al., 2020).

Ethical pillars and their managerial parallels

As outlined by Beauchamp and Childress (1979), the four ethical pillars; autonomy, beneficence, non-maleficence, and justice, are central to evaluating the responsible integration of AI in healthcare. Applications of these principles, however, must be operationalised through managerial decisions, organisational processes, and governance structures. In healthcare settings, therefore, AI adoption compels institutions to translate commitments to ethical AI

adoption into actionable institutional behaviours that make these pillars inseparable from organisational practices.

When AI systems enter clinical settings, preserving patient autonomy, that is the capacity of patients to exercise control over matters related to their care and involves more than a formal acknowledgment of patient choice. It entails institutional procedures that encourage informed decision-making. For example, clear explanations of algorithmic functions that account for different levels of health and digital literacy should be regarded as an outcome of managerial communication and institutional design, not as an ethical aspiration outlined in policy documents (Laï et al., 2020). Managerially, this demands workflow designs that are transparent in how AI systems function to preserve human oversight in clinical encounters (Laï et al., 2020). Ensuring autonomy is therefore not only an ethical goal but a communication, training, and process-engineering task.

A commitment to beneficence demands more than the assumption that technological innovation will naturally promote patient well-being and care. It calls for institutional frameworks that ensure AI systems demonstrably contribute to better clinical outcomes. Such frameworks might include developing protocols that measure AI performance against quality standards (Kuziemsky et al., 2024), monitoring its impact on workflow and quality of care. Adopting a management-based approach to beneficence involves establishing continuous quality-measurement practices and investing in evidence-based implementation (Catalina et al., 2023). This approach goes beyond a normative ethical ideal of beneficence towards an understanding of beneficence as capacity-building of organisational expertise.

The fundamental principle of non-maleficence which involves anticipating and minimising harms such as bias, error propagation, or data breaches, becomes more imperative in AI-embedded environments. Organisational decision-making and institutional protocols must therefore adopt systematic risk-management processes that can anticipate as much as possible the harms that may arise. Clearly defined auditing mechanisms, responsibilities, and cybersecurity procedures (Char et al., 2018) are primarily institutional design principles that help strengthen risk-management systems, particularly regarding AI integrated systems.

In the context of health AI settings, justice refers to the equitable and fair distribution of benefits for patients. Managerially, this ethical pillar is faced with challenges of resource allocation and strategic planning that protect against technological inequities between urban and rural regions, public and private sectors, or digitally literate and marginalised groups (WHO, 2021). For organisations, justice is fundamentally a governance and budgeting issue since it is inseparable from decisions about budgeting, procurement, deployment, and long-term maintenance of AI resources (WHO, 2021). Leaders must anticipate how technologies might reinforce or widen disparities and design policies that enable equitable scaling across regions and sectors. Unlike the ethic ideal, justice in managerial settings is realised not through mere declarations of fairness but rather through governance frameworks that actively redistribute technological capacity.

These pillars, when embedded in management workflows, turn ethical concepts into actionable deliverables. Stakeholder theory emphasises balancing the interests of patients, clinicians, managers, policymakers, and technology vendors, while change management frameworks highlight the leadership practices required to move ethical norms into the realm of organisational transformation. These combined perspectives clarify that ethical AI adoption is not only about identifying values that safeguard against irresponsible AI usage and deployment, but is also about building systems and institutional capacity that can operationalise such values

The recommendations that follow build directly on this alignment of ethical oversight and management frameworks by identifying the institutional transformations needed to operationalise the four pillars in small-state health systems.

Global equity and small-state vulnerabilities

The World Health Organisation (2021) has warned that AI adoption risks exacerbating inequalities between high-income countries (HICs) and low- and middle-income countries (LMICs). These risks are particularly acute for small states such as Trinidad and Tobago, given infrastructural and financial limitations. Global inequities raise ethical questions of fairness. From a managerial perspective, they create strategic dependency: small states may rely heavily on foreign firms for technology, training, and maintenance. This dependence heightens vulnerabilities in governance, data sovereignty, and financial sustainability (Kouznetsov et al., 2023). Thus, management leaders in small states must carefully evaluate partnerships, negotiate contracts, and develop local capacity to reduce reliance on external actors (Bahaw et al., 2025).

Confidentiality and data governance

Confidentiality and data privacy are among the most pressing concerns with AI in healthcare. LLMs and ORAs often store large amounts of sensitive patient data, raising risks of surveillance capitalism (Zuboff, 2019) if private firms monetise information. Ethically, this threatens patient trust. It presents a governance problem managerially, where organisations need clear policies on data storage, consent, and third-party use. Effective governance requires investment in cybersecurity infrastructure, staff training, and oversight committees to monitor compliance (Johnson, 2019). Health institutions risk legal liabilities, reputational damage, and public backlash without these safeguards.

Informed consent and managerial accountability

Modern informed consent emphasises a "particular patient" approach tailored to individual needs and values. However, delegating consent processes to LLMs risks reducing this to a generic, standardised exercise. Ethically, this undermines autonomy. Managerially, it raises accountability questions such as who is responsible when automated systems fail to communicate risks accurately? Leaders must design oversight systems ensuring that AI augments, rather than replaces, the physician-patient relationship. This requires clear role definitions, escalation protocols, and continuous staff training to ensure that ultimate responsibility lies with human professionals (Char et al., 2018; Gillies & Smith, 2022). Ethical challenges such as autonomy, beneficence, non-maleficence, and justice are not abstract concepts; they manifest in concrete managerial issues of accountability, resource allocation, risk management, and stakeholder trust. For Trinidad and Tobago, aligning ethics with management ensures that AI adoption does not deepen inequalities or erode patient trust but rather strengthens the healthcare system.

External factors shaping AI adoption in small-state health systems

Technological change in healthcare does not occur in a vacuum. Even the most advanced AI applications, robotics, oncology diagnostics, and e-health platforms, depend on the broader institutional, cultural, and managerial context in which they are implemented. For small states such as Trinidad and Tobago, external factors play a decisive role in determining whether AI adoption translates into improved patient outcomes, organisational efficiency, and equity, or whether it deepens inequalities and creates new ethical risks. These external factors can be broadly categorised into five areas: workforce competence, administrative capacity, leadership and change management, culture and public trust, and institutional governance and regulation. Each reflects the interdependence of ethical and managerial concerns (Char et al., 2018; WHO, 2021).

Workforce competence and training

AI systems require more than sophisticated technology—they demand a workforce capable of operating, interpreting, and supervising these tools. Ethically, insufficient training undermines beneficence and non-maleficence, as poorly prepared staff may misuse AI systems, compromise patient privacy, or misinterpret

algorithmic outputs (Beauchamp & Childress, 1979). Managerially, workforce competence is a strategic human resource priority. Leaders must invest in structured training pathways, allocate budgets for continuous education, and establish incentives that encourage staff engagement and proficiency (Shinners et al., 2020).

Trinidad and Tobago's partnership with Singapore to train public-sector officials in AI is a promising step (Ministry of Public Administration, 2024). Yet training initiatives must be embedded within long-term organisational strategies rather than treated as isolated workshops. Sustained capacity-building programmes aligned with institutional goals create a pipeline of AI-literate clinicians and administrators who can steward technology ethically and effectively (Albaladejo-González et al., 2024). Workforce development is therefore both an ethical safeguard and a managerial necessity.

Administrative capacity and resource constraints

The ability of institutions to manage AI systems depends heavily on administrative capacity—an area where many small states face persistent constraints. Limited financial resources, staffing shortages, and infrastructural gaps may hinder sustainable adoption (Bahaw et al., 2025). Ethically, resource constraints risk inequity, raising concerns about justice when AI benefits accrue disproportionately to certain populations (WHO, 2021). Managerially, leaders must navigate difficult trade-offs, selecting which innovations to pursue and ensuring that adoption does not outpace system capacity (Gillies & Smith, 2022).

Trinidad and Tobago's introduction of health service robots without a supporting ethics policy or administrative framework illustrates this tension (Ministry of Health, 2024). While symbolising innovation, the rollout exposed gaps in oversight, data governance, and equitable distribution. Without strengthened administrative systems, even well-intentioned investments may become fragmented, unsustainable, or inequitable (Johnson, 2019). Administrative capacity thus forms the backbone that enables ethical principles to be realised in practice.

Leadership and change management

Leadership determines whether AI innovations are absorbed into organisational culture or resisted at the front lines. Ethically, leaders must safeguard patient autonomy, staff dignity, and community trust when adopting new technologies (Laï et al., 2020). Managerially, AI integration requires a structured change management approach: articulating a clear vision, creating a sense of urgency, engaging diverse stakeholders, and generating early wins to build momentum (Kotter, 1996).

Small-state contexts heighten leadership pressures due to limited personnel and institutional bandwidth. This makes transformational leadership particularly important—leaders who can inspire confidence, navigate uncertainty, and cultivate organisational readiness (Catalina et al., 2023). Effective leadership thus anchors both the ethical and managerial aspects of responsible AI adoption.

Culture and public trust

AI adoption is shaped not only by technical capacity but by cultural attitudes and social legitimacy. Ethically, trust is essential to autonomy and informed consent; patients who distrust AI systems cannot meaningfully consent to their use (Blease, 2024). Managerially, trust becomes a public engagement challenge requiring clear communication, community consultation, and culturally resonant messaging (Fast & Horvitz, 2016).

In Trinidad and Tobago, uneven digital literacy and persistent socio-economic divides mean that enthusiasm for e-health tools may coexist with scepticism or mistrust among rural communities, older populations, and lower-income groups (De Matas et al., 2025). Addressing these disparities requires leaders to pair AI deployment with public education campaigns, local partnerships, and transparent explanation of risks and benefits. Public trust is thus not a by-product of technical performance but a managerial and ethical outcome that must be intentionally cultivated (Zuboff, 2019).

Institutional governance and regulation

The absence of a national ethics policy on AI in Trinidad and Tobago highlights a critical governance gap. Ethically, robust governance ensures justice, accountability, and protection from misuse (WHO, 2021). Managerially, governance requires coordination across ministries, health authorities, regulatory agencies, and international partners. Effective frameworks must balance innovation with oversight, mitigating risks without stifling progress (Sætra & Danaher, 2022).

While small states often lack the institutional depth of larger countries, this can create agility: the ability to design context-specific governance frameworks that address local health system realities rather than borrowing ill-fitting models from abroad (Gillies & Smith, 2022). Governance, therefore, functions as the structural mechanism through which ethical aspirations are translated into enforceable, sustainable managerial practices.

Interconnectedness of external factors

It is important to note that these factors do not operate in isolation. Workforce competence depends on leadership, which is constrained by administrative capacity, and public trust is shaped by culture and governance. This interconnectedness highlights the need for an integrated approach to AI adoption, where ethical considerations and managerial practices reinforce each other (Char et al., 2018). For example, training staff without addressing cultural trust issues may fail to improve adoption rates. Similarly, establishing governance frameworks without building administrative capacity risks producing rules that cannot be enforced. Therefore, a holistic approach is necessary to ensure that AI adoption advances ethical values and organisational effectiveness. Such an approach might be best informed by two overlapping management theories: stakeholder theory which, in the context of ethical AI governance, emphasises balance of interests among diverse groups such as patients, clinicians, managers, policymakers, and technology developers, and change management theory (Kotter, 1996) which provides a structured approach to embedding ethical principles into organisational transformation. Both theories underscore responsible AI adoption as premised on the alignment between ethical values and organisational processes.

Policy and managerial recommendations

Integrating AI into healthcare requires more than technical readiness; it requires governance structures, leadership practices, and organisational capabilities that translate ethical principles into operational routines. The recommendations below apply the ethical–managerial parallels outlined in Section 2.2, offering practical guidance for Trinidad and Tobago and comparable small states.

Strengthening regulatory frameworks

Regulatory reform serves both justice and non-maleficence by establishing safeguards that ensure fairness, safety, and accountability in AI deployment (WHO, 2021). For managers, updated regulations offer governance clarity, reduce uncertainty, and define liability, enabling more confident allocation of organisational resources (Johnson, 2019). Small states can adopt regulatory sandboxes to test emerging tools in controlled environments before full implementation (Sætra & Danaher, 2022). These mechanisms bridge ethical concerns with actionable governance strategy.

Building workforce competence and empowerment

Advancing beneficence and autonomy requires a workforce capable of understanding, operating, and critiquing AI systems. Managerially, this means structured training programmes, continuous education, and AI literacy curricula in medical and administrative education (Albaladejo-González et al., 2024). Kotter's change-management principles reinforce that building competence is essential for sustaining system-wide transformation. Empowering staff also involves psychological safety—creating an environment where workers can report errors or biases without fear, enabling adaptive learning and trust (Shinners et al., 2020).

Institutionalising AI audits and oversight

To uphold non-maleficence and justice, AI systems must be monitored through ongoing performance audits, bias detection tools, and clear escalation protocols. From a management standpoint, audits provide data for decision-making and continuous improvement. Tools such as the Disparities Impact Statement, PROGRESS framework, IAT measures, and Equity Quality Improvement tools (Chinta et al., 2024) can be adapted to small-state contexts. Independent oversight committees enhance legitimacy and help maintain public trust.

Incentivising ethical AI use

Organisations respond to incentives, making them powerful tools for embedding ethical behaviour. Justice and beneficence are strengthened when public agencies offer tax benefits, grant funding, or formal recognition to institutions demonstrating responsible AI use. Internally, leaders can reward teams for transparent reporting, innovations that enhance patient welfare, or practices that strengthen data stewardship (Sookhai, 2024). Incentives ensure that ethical behaviour becomes habitual rather than exceptional.

Transparency, accountability, and policy integration

Autonomy and justice depend on clear communication with the public regarding how AI systems operate, what data they use, and how decisions are made (Blease, 2024). For managers, transparency enhances legitimacy, reduces resistance, and builds a durable social license for innovation (Fast & Horvitz, 2016). Practical steps include publishing guidelines, releasing audit summaries, and developing public dashboards that track where AI tools are in use. These practices should be embedded into organisational workflows, ensuring that transparency functions as an operational norm rather than an ad hoc activity.

Ethical recommendations cannot be implemented without management practices. Regulatory frameworks require administrative capacity; workforce training requires leadership support; audits require institutional structures; incentives require financial and organisational resources; and transparency requires communication strategies. Thus, the recommendations outlined above are mutually reinforcing. For example, openness without oversight is ineffective, and workforce empowerment without incentives may falter. Together, these elements form an integrated framework that ensures AI adoption is not only technologically feasible but also ethically grounded and managerially sustainable (Char et al., 2018; Gillies & Smith, 2022). The practical applicability of this framework is observed in the Trinidad and Tobago examples previously discussed. The use of robotics requires management regulations. For example, AI oncology tools highlight the links between workforce competence and beneficence. Similarly, e-health platforms emphasise transparency and data governance as central to building trust. Both examples demonstrate how small-state health systems can implement an ethics–management integrative framework in policy development.

Towards small-state model for ethical AI adoption

Small states such as Trinidad and Tobago face unique challenges, limited scale, resource constraints, and reliance on external technologies, but these features allow for agility and innovation. By tailoring ethical and managerial frameworks to their context, small states can become laboratories of responsible AI adoption, generating lessons for other LMICs and even for larger states grappling with equity and governance issues (WHO, 2021). This model emphasises: agility in policy experimentation (e.g., regulatory sandboxes), integration of ethics into management practices, collaboration between government, healthcare institutions, private firms, and communities, and adaptability, ensuring that frameworks evolve as technologies change. The recommendations outlined here highlight the necessity of bridging ethical imperatives with managerial practices. Strengthened regulation, empowered workforces, regular audits, incentivised responsibility, and transparent accountability form the foundation of a

sustainable AI adoption strategy. For Trinidad and Tobago, this integrated approach ensures ethical use of AI in healthcare and offers a model for other small states navigating the challenges of digital transformation.

Conclusion

The transformative potential of artificial intelligence in healthcare is undeniable, but so are the ethical and managerial challenges accompanying its adoption. For Trinidad and Tobago, as for many small states, the question is not whether AI should be integrated into healthcare systems but how it should be done so as to promote equity, accountability, and trust. This paper has argued that AI adoption cannot be understood solely as a matter of technological advancement or medical ethics. It must also be framed as a managerial and organisational issue, requiring leadership, governance, and strategic foresight. By examining national initiatives such as robotics, oncological diagnostics, and e-health platforms, we have shown how technological innovations intersect with broader questions of change management, workforce readiness, and institutional capacity. These case examples highlight the dual nature of AI adoption: it brings new opportunities for efficiency and patient care but also raises complex ethical concerns regarding autonomy, justice, and non-maleficence. Without managerial systems to navigate these tensions, the benefits of AI risk being undermined by inequity, mistrust, and inefficiency.

The discussion of external factors further highlights the importance of context. Workforce competence, administrative capacity, leadership, cultural trust, and institutional governance are not peripheral issues; they are central determinants of whether AI adoption succeeds or fails. Each of these factors embodies both an ethical principle and a managerial challenge. For example, ensuring justice in AI distribution requires ethical awareness and the strategic allocation of scarce resources. Protecting autonomy in informed consent requires transparency and organisational accountability structures that clearly define roles and responsibilities.

Our recommendations sought to bridge this ethics–management divide. Strengthening regulatory frameworks, building workforce competence, institutionalising audits, incentivising responsible practices, and promoting transparency are not abstract ideals; they are actionable strategies grounded in ethical reasoning and managerial theory. They form an integrated framework for responsible AI adoption in small states. Importantly, these recommendations emphasise that ethical aspirations must match organisational capacity. Regulations without enforcement mechanisms, training without incentives, and transparency without communication strategies will fall short. Success lies in the integration of values with systems, principles with practices.

For the Management & Business audience, the contribution of this paper lies in its repositioning of AI in healthcare as a managerial issue. Digital transformation, whether in healthcare or other sectors, is not simply a technical process but an exercise in governance, leadership, and organisational change. Trinidad and Tobago's experience demonstrates that despite resource constraints, small states can act as laboratories for innovation in ethical AI governance. Their size allows for agility, experimentation, and adaptation, offering lessons that extend beyond the Caribbean to other LMICs and even to larger states seeking to balance innovation with responsibility. The global relevance of this illustrative example lies in its emphasis on integration. Too often, ethics and management are treated as separate domains: ethicists frame principles, while managers implement strategies. Yet in the context of AI, the two are inseparable. Decisions concerning data privacy, workforce training, or patient consent are simultaneously ethical and managerial. Recognising this interdependence allows for more holistic approaches to maximise benefits while mitigating risks.

In closing, the adoption of AI in Trinidad and Tobago's health sector illustrates both the promise and the peril of digital transformation. It highlights the need for small states to craft context-specific frameworks that embed ethical principles within managerial practices.

By doing so, they safeguard patient rights and public trust and strengthen their institutional capacity to govern technological change. The lessons presented here reinforce a broader truth: the future of AI in healthcare, and indeed in business and management more broadly, will be determined not only by the sophistication of the technologies we adopt but also by the wisdom, integrity, and foresight with which we manage them.

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