# AI on Bhutan's Terms: Embedding Human Values into Technology

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Artificial intelligence (AI) is often presented as an unstoppable force that societies must adapt to. Yet AI systems do not emerge independent of human influence. Every system reflects choices about what should be optimised, measured, protected, and prioritised. The question facing Bhutan is not simply whether it will adopt AI, but whether the AI systems it adopts will reflect Bhutan's values around well-being, trust, culture, community, and environmental stewardship. Rather than rushing to adopt every new development, Bhutan's measured approach to modernisation creates a unique opportunity and presents the advantage of learning from early adopters to help guide building safeguards into its AI ecosystem from the beginning.

By adopting technological advancements at a later stage, Bhutan benefits from observing the challenges and risks experienced elsewhere. As a result, many potential threats can be identified and addressed before implementation. This provides Bhutan with a unique opportunity in the age of AI. Rather than retrofitting safeguards after problems emerge, the country can intentionally design and deploy AI systems with ethical considerations, protections, and societal well-being at their core from the outset.

## Shaping AI on Bhutan's Own Terms

In many parts of the world, the development of AI is framed as a trade-off between innovation and regulation, speed and safeguards. Countries often feel pressured to accelerate technological adoption to remain competitive, sometimes at the expense of broader social and ethical considerations. Bhutan's development philosophy, however, suggests a different path.

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Grounded in principles of well-being, cultural preservation, community cohesion, trust, and environmental stewardship, Bhutan demonstrates that technological progress does not have to come at the expense of a nation's values. Instead, these values can serve as guiding principles that shape how technology is designed, governed, and ultimately used. By placing human and societal outcomes at the centre of innovation, Bhutan has an opportunity to pursue technological advancement in a way that strengthens rather than undermines its national identity.

The IEEE Standards Association (IEEE SA) often distinguishes between Responsible AI and Ethical AI. Responsible AI focuses on designing systems correctly from the outset. Ethical AI focuses on ensuring that deployed systems operate in ways that uphold transparency, accountability, privacy, and fairness. Both are important, but the strongest opportunity exists at the design stage, before technologies become deeply embedded into society.

For Bhutan, this distinction is particularly relevant. The country's development philosophy has long focused on intentional decision-making and long-term societal outcomes. AI adoption can follow the same principle by ensuring societal priorities are incorporated before technologies scale across public services, education, healthcare and economic development.

IEEE's work on ethically aligned design and value-based engineering demonstrates that countries do not have to choose between technological progress and cultural values. Through standards and governance frameworks, societal priorities can be incorporated directly into technology design.

## From Values to Requirements: The IEEE 7000 Approach

Values cannot remain aspirations. For values to influence technology, they must be translated into frameworks that engineers, policymakers, and organisations can actually implement. This challenge inspired a body of work within IEEE that began with Ethically Aligned Design and later evolved into the IEEE 7000 series of standards.

IEEE 7000 introduces a process for identifying stakeholder values and incorporating them directly into system design. The objective is not to prescribe which values a society should choose. Rather, the objective is to

ensure that whichever values a society prioritises can be translated into technical requirements and governance practices.

At the centre of this effort is Value-Based Engineering, which encourages organisations to identify societal impacts early, evaluate potential harms and incorporate safeguards before deployment. This approach helps address concerns such as privacy, transparency and stakeholder trust while reducing implementation risk.

For Bhutan, these frameworks offer something particularly valuable: a mechanism for ensuring that cultural preservation, environmental stewardship, community cohesion and human well-being are not aspirational goals operating alongside technology, but design requirements built directly into technological systems themselves.

Translating values into system requirements is only part of the challenge. AI systems must also earn the trust of the people who use them. Trust is built through transparency, accountability, privacy protections and meaningful governance mechanisms. These principles help ensure that intelligent systems operate in ways that are understandable, reliable, and aligned with societal expectations.

## From Gross National Happiness to Responsible AI

In Bhutan, one connection stands out particularly clearly: its Gross National Happiness (GNH) philosophy, which prioritises well-being alongside economic development, shares common ground with emerging efforts to evaluate technology through human outcomes rather than purely technical outputs.

That alignment is reflected in IEEE 7010, which guides assessing the impact of autonomous and intelligent systems on human well-being. Rather than focusing exclusively on performance metrics, IEEE 7010 encourages organisations to evaluate how technology affects people, communities and long-term societal outcomes. The IEEE recommended practice directly aligns with the GNH framework as a model for measuring quality of life.

The standard, similar to GNH, does not rely purely on economic output, i.e. Gross National Product (GDP) as the key criterion to measure societal

progress. The measures of success of a society are around the aspects of human well-being, ecological balance, the importance and the sustenance of the community, and other key parameters.

The GNH philosophy has shaped Bhutan's policymaking for decades, influencing decisions related to education, healthcare, environmental conservation, community vitality and psychological well-being. It has also guided the country's efforts to balance technological innovation with sustainability. For example, Bhutan is exploring renewable energy-powered AI data centers that can support advanced digital infrastructure while leveraging the country's abundant clean energy resources and preserving its natural environment.

This longstanding commitment to Gross National Happiness demonstrates that measuring progress through human well-being is not a new concept. What is new is the opportunity to apply that philosophy directly to the design, governance, and assessment of intelligent systems.

## From Standards to Practice

Establishing standards is only one part of building trustworthy AI. Organisations must also demonstrate that those standards are being implemented consistently and effectively. This evolution from principles to practice is one of the motivations behind IEEE CertifAIEd™, which provides assessment and certification frameworks focused on transparency, accountability, privacy, and algorithmic bias mitigation. Standards provide guidance, but guidance alone does not guarantee implementation.

CertifAIEd reflects a broader shift occurring across the AI ecosystem. The conversation is no longer limited to defining ethical principles. Increasingly, governments, organisations, and citizens want evidence that those principles are being implemented and measured in practice.

Organisations such as IEEE are helping to advance these efforts through standards and certification programmes focused on trustworthy and transparent AI systems. IEEE's work on ethically aligned design and trustworthy autonomous and intelligent systems promotes best practices that address critical concerns such as algorithmic bias, explainability, data privacy, and accountability. Through initiatives such as the CertifAIEd™

programme, professionals and organisations can demonstrate their commitment to responsible AI implementation by adhering to established ethical standards and governance frameworks.

For countries like Bhutan, these standards provide a framework for building public trust, helping ensure that AI innovation advances in a way that is transparent, accountable, and aligned with the needs of society. By adopting recognised frameworks for trustworthy AI, governments can translate that trust into tangible outcomes, ensuring that AI-driven solutions in healthcare, education, public services and economic development are transparent, fair and aligned with societal values. In doing so, Bhutan can harness the benefits of AI innovation while preserving the ethical principles and community-centred approach that define its vision for sustainable progress.

The global conversation about AI is often framed as a race. Yet for many societies, the more important question is not how quickly AI is adopted, but whether it reflects the values of the people it is intended to serve.

Bhutan's experience highlights a different approach. Rather than treating innovation and values as competing priorities, AI can be designed to reinforce well-being, trust, cultural identity and societal goals. Standards such as IEEE 7000 series and programmes such as CertifAIEd provide practical guidance for translating those aspirations into measurable outcomes. For example, an aspiration to build trust worth AI can be translated into measurable requirements such as bias testing, transparency disclosures and human oversight, with clear metrics used to evaluate performance.

Ultimately, the future of AI should not be determined solely by technological capability. It should be shaped by the values, priorities, and well-being of the communities it serves. Bhutan's opportunity is not simply to adopt AI. It is to help demonstrate how societies can shape AI on their own terms.