The Artificial Intelligence Ecosystem and DHI 10X

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Every age has a point in time in which reality is altered by various factors. In this time, the advent of Artificial Intelligence (AI) will dictate the future as we know it. The discussion about AI is still evolving; words and phrases identifying parts of the entire system have been used synonymously with AI itself.

While the world is looking forward to building and owning the next great thing to control the AI movement, Bhutan is identifying strategic niche areas to develop, where the nation will be resilient to withstand AI's negative impacts, but will also contribute in a meaningful and mindful way to the AI movement. For contextualisation, and to simplify the smorgasbord of words in everybody's vocabulary, understanding has to start with a few definitions, and the architecture of current AI.

Artificial Intelligence is fundamentally machines attempting to mimic human intelligence. While the AI field is broad, with many branching but related technology stacks, current conversations are dominated by "generative AI", many of which employ "transformers".

AI has evolved tremendously to the point where generative AI is now able to focus on generative creation (producing brand new and original content based on existing data), autonomous reasoning (think through complex problems, make logical decisions, and correct its own mistakes without human intervention), and multimodal understanding (processing, connecting and interpreting different types of data simultaneously).

Transformers are techniques of working with data which allow developers to build language models (LM), which are the set of codes to allow AI to think and respond in human language. Transformers and language models are a few of the many components of AI software.

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To run the software, there are also AI hardware components, many of which have had significant impact on the current international economy. These include computational data centres, which allow language models to learn and grow; graphical processing units (GPUs), or graphics cards, composed of powerful semiconductors that allow the data to be processed; and, just as important, communication infrastructure and energy.

In 2025, the global sales of semiconductors reached USD $791 billion. Global sales of energy during that same time have been estimated between USD two trillion to $9.5 trillion, of which around 20% of demand was for AI.

Given the expansive field -- including software, hardware, and underlying digital infrastructure -- Druk Holding Investments (DHI), under its 10X strategy, is testing multiple hypotheses to leverage AI through a sovereign AI ecosystem that contributes internationally through value-based intentions.

DHI's 10X strategy is a blueprint to reimagine what DHI and its group can become and achieve over the next decade. The strategy aims to generate a group revenue of Nu. 700 billion by 2035, enhancing economic resilience and developing innovation as a core pillar of Bhutan's economy.

Part of the ambitious strategy is to integrate an AI ecosystem as a contributing industry to Bhutan's economy. This ecosystem will be guided by the philosophy of Gross National Happiness, to ensure AI can serve for the good of all.

Tiny pockets exist in the international AI landscape that synergise well with Bhutan's aim to develop a sovereign language model guided by Bhutan's realities and values. The current landscape of language models is dominated by big-tech hyperscalers like Google, Microsoft, Meta, etc. With the consolidation of AI under similar and like-minded entities, values and outputs become homogenised; singular points of failure are introduced; talent and dependency are concentrated.

A Bhutanese sovereign language model would indicate that Bhutan would be able to control several layers of the AI ecosystem (data, model, compute, language and cultural, etc.) without being dependent on any external

parties. Due to the scarcity of resources for countries like Bhutan, we will have to explore innovative methods and means that contribute to the overall repository of global AI knowledge.

The juxtaposition of Deep Seek and ChatGPT is an inspiration for those who have to rely on innovation and ingenuity, more so than being well-resourced. Both Deep Seek and ChatGPT are generative AI. ChatGPT is well-supplied, allowing the team access to better hardware and infrastructure. Deep Seek was limited in hardware and had to improve their coding to ensure that the system was more efficient, at a fraction of the cost.

Beyond the structural realities, Bhutan's advantage also lies in its longstanding institutional commitment to Gross National Happiness (GNH), a development philosophy built around collective wellbeing, environmental stewardship, and cultural preservation, rather than performance metrics alone.

If Bhutan is able to develop a sovereign language model trained and fine-tuned with GNH principles embedded in its objectives - as part of how the model is trained to weigh trade-offs against goals - the risk of chasing narrow benchmark scores through harmful or unauthorised means would be highly reduced.

If queried by an entrepreneur for a business model, the model could potentially have GNH weightages, which would allow for it to generate responses that are holistic in nature; meaning the responses would not only take into account business metrics but also ensure that they incorporate the promotion of GNH pillars.

The recent Open AI case does well to exemplify one of the many dangers of having efficient narrow-minded models. Open AI was testing cybersecurity capabilities of a model which was closed off to the internet. The model was able to leverage loopholes and avoided the test environment to attack another company's system.

A values-aligned model would be unlikely to make the disadvantageous trade-off between completing the task efficiently and causing harm to achieve it. A GNH value-based framework would seek collective wellbeing

over pure optimisation as a differentiator to how current models function. As with any exciting development, the proposed model would require rigorous testing before being launched.

To address the gap in programming and software skills for AI development, DHI is currently engaging its portfolio of companies through a programme called Innovation Accelerator, in which one initiative is to develop a DHI data lake, which will allow models to be built on data sets that currently exist in siloed data-bases in the portfolio companies. The data lake initiative will allow an opportunity to unlock value through group-level data creating business efficiencies, new business lines, products and data-based decision-making.

DHI is also engaging various stakeholders for a purposeful AI and robotics (PAIR) conference to bring together value-driven like-minded world-class academics to drive good-oriented fundamental research. While the dates have yet to be finalised, it is being designed to be an annual conference to bring together international academics to share the latest in AI & Robotics sciences. DHI will be the local counterpart, and the goal is to include Bhutanese and academic research institutions to co-develop research for impact.

In the more foundational and physical layer, DHI's portfolio activities are well suited to build the ecosystem needed to support an AI ecosystem. With DHI group's activity in the energy and telecommunications sector set, the DHI group is placed to be a key player in building the national AI ecosystem.

The AI opportunity for the group allows Bhutan to introduce additional business lines in strategic industries that increase economic productivity, through the demand for and growth of additional and new skills and human resources in telecommunications. This will also create more demand in the energy sector and the opportunity to add value to the energy produced domestically through data centres and data centre activities.

As of now, Bhutan's current inventory of data centres and connectivity needs to be upgraded. As part of the 10x Strategy, DHI is looking to add 15 GW of hydropower and 5GW of solar power. While the additional power will be introduced to address Bhutan's current power shortage in the

lean season (~1,000 GWh annually), the electricity infrastructure planned will be able to support data centres. Bhutan Telecom, DHI group's telecom company, is actively exploring improving connectivity within Bhutan and also international connectivity.

The type and size of data centres established will depend on the demand, but more importantly, Bhutan will also have to consider the impact of infrastructure upgrade and development through a GNH lens.

For Bhutan, the introduction of the AI ecosystem opens up a next-generation industry, one that allows it to contribute internationally. Much like the rest of the world, Bhutan is on the cusp of being introduced to the use of AI as the new normal. To ensure this path would allow us to do good, we will be guided by the philosophy of GNH for both the hardware and software.

Note: In preparation for this article, the author used Google Gemini, Open AI ChatGPT and Anthropics Claude for fact checking and initial research. The ideation, concept and content are all the author's own or the entitity that the author is representing.