



## The Laputa Rural Connectivity Initiative

\*This case is a hypothetical scenario created for instructional purposes. The regions, companies, individuals, and situations mentioned in this case are fictional and not based on real facts.

A recently widowed 71-year-old individual, Mr. Dae, has been retired for five years. Mr. Dae has recently moved back to his native Laputa Island, leaving behind the bustling urban metropolis in which he lived with his recently departed spouse. His relocation raises two concerns.

Firstly, Mr. Dae is concerned whether he will continue to have access to quality health care services in a more rural environment. Mr. Dae currently takes medication for hypertension, and he is also mildly disabled due to a car accident he was involved in several years ago. Mr. Dae is still sad about leaving his friends and family in the city, and worries whether he can adapt to life again in his ancestral home.

The Laputa regional government has recently initiated a new tech-enabled initiative (called the Laputa Rural Connectivity Initiative, or LRCI), that is designed specifically to increase the well-being and comfort of individuals like Mr. Dae.

According to the LRCI's chief administrator, Mr. Dae in the near future should be able to access a range of medical services after he relocates to Laputa. Some of the LRCI's features would build on existing technologies pioneered during the recent COVID public health crisis. The program would, for example, feature a robust telemedicine component that would allow Mr. Dae to skip routine in-person visits to hospitals or local health centers to refill his prescription for his hypertension medication. Furthermore, the LRCI would be augmented by AI technologies, taking it beyond existing telemedicine programs. For all routine interactions, Mr. Dae would interact with an AI-powered "Digi-Doc," who would engage socially with Mr. Dae, answer routine medical inquiries, and casually ask routine diagnostic questions about Mr. Dae's social, psychological, and medical well-being. Based on these various inputs, the LRCI "Digi-Doc" would instantaneously prepare an assessment of Mr. Dae's health care needs, which would have to be signed off by a licensed human doctor before the "Digi-Doc" concludes the consultation. The "Digi-Doc", not being pressed for time or tied into a fixed appointment schedule, could spend "quality time" with Mr. Dae, engaging with him socially while a "real" doctor sitting 'in the loop' can conduct the necessary oversight of the AI's analysis.

Mr. Dae would also be given a "digital twin" avatar. These "virtual replicas" would simulate Mr. Dae's current health status and can be used by medical professionals to simulate future health

interventions, including preventive treatment for long-term illness or issues associated with his disability.

Other vulnerable populations would also benefit from the LRCI. One of Mr. Dae's neighbors, for example, is a caretaker for her daughter who has Down Syndrome. According to preliminary discussions she has had with LRCI administrators, her daughter can use metaverse-enabled technologies to become more independent, and potentially even to begin earning some modest income. To achieve this, the LRCI aims to tap into a nationwide effort to provide extended reality (XR) and artificial intelligence (AI) technologies to enhance the education and well-being of individuals living with Down Syndrome.

Behind the front-end interface visible to Mr. Dae, the LRCI would be built on a revolutionary approach to the delivery of high-quality medical and psycho-social services. This approach would partner medical professionals in Laputa directly with colleagues in urban areas in Balnibarbi and beyond. By leveraging digital twin technology, a virtual environment can be constructed to simulate operating rooms and training facilities, enabling precise and error-free medical examinations, surgeries, and education. Furthermore, using augmented reality, a patient's internal organs can be visualized, and doctors can be guided during surgery (or other medical interventions) based on the patient's medical imaging and digital twin simulation, indicating organ positions and sizes.

Moreover, LRCI plans to open various social forums to the patients, which will enable them to receive medical consultations and engage with fellow patients suffering from the same or similar ailments, while sharing health information. Like visiting a physical hospital, patients can make appointments, complete payments, and access test results. Throughout the screening process, patients can alleviate their fears and curiosities with a personalized nurse-avatar, thus providing access to high-quality and individualized counseling while also reducing the burden on "real world" medical staff who simply lack the time to provide such individualized medical services.

The LRCI further hopes to improve patients' mental and psychological health, especially for the elderly. The elderly, who may experience limited interaction and mobility constraints, are prone to feelings of isolation and an increased risk of cognitive decline. Recognized as a viable reminiscence therapy, experiences achievable within the metaverse are known to be beneficial for the elderly concerned about short-term memory decline.

In addition, Mr. Dae can also join a variety of VR courses and workshops through the LRCI's "Rural Living Community." A monthly facilitated "Rural Living Conference," held in a VR conference hall, for example, would offer Mr. Dae the opportunity to share his knowledge, ideas, and network with experts and other individuals who have also recently relocated to Laputa's rural areas. The conference hosts debates on various rural policies.

The "Rural Living Conference" would also serve as a collaborative policy development incubator. Select policy proposals discussed during the conference could be subject to "virtual voting," where participants would cast votes in favor or against certain local regulations and policies. Drawing on the same digital twin technology at the heart of the LRCI's medical accessibility measures, these draft policies would then also undergo a "virtual policy simulation," in which the future impacts of any such proposed policies could be simulated and simultaneously observed by the real-world rural living conference participants.

The provincial government has realized that to facilitate the development of the medical metaverse, changes in the healthcare service delivery system are required. Remote consultations currently focus predominantly on large-scale (and urban) hospitals. Additionally, the policy makers will need to discuss issues of accountability and medical malpractice. To realize their vision of an inclusive digitally connected deliberative community, policy makers will also need to ensure broad participation from a diverse range of community members regarding the Rural Living Community.

At this time, administrators are quite worried that their efforts to promote the LRCI, which is intended to *increase* social support and connection, could inadvertently result in the exact opposite outcome. Severe social withdrawal has significant consequences on well-being, depriving individuals of social support and connection. This isolation can lead to intense feelings of loneliness and increase the risk of mental health issues, such as depression, anxiety, and even self-destructive behaviors like suicide. The metaverse could either exacerbate or help solve this problem. The administrators of the LRCI are determined to embrace the potential of the metaverse and establish guidelines to incentivize the creation of a digital space that promotes social connection, emotional well-being, and a sense of community, not the opposite.

Should the trial period unintentionally exacerbate the marginalization of vulnerable groups in society, the Laputa Provincial Government has already agreed to promptly discontinue the LRCI. As a taxpayer-funded initiative, it will face rigorous scrutiny from the wider public. The Provincial Government is therefore very eager to identify the key metrics it can use to measure and evaluate the success of the initiative.