Chapter 10
Convergence of Indigenous Knowledge Systems and Artificial Intelligence:
Forging Pathways Between Indigenous Wisdom and Technological Innovation

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ABSTRACT

This chapter examined the potential integration of Indigenous Knowledge Systems (IKS) and Artificial Intelligence (AI) in preserving and revitalizing indigenous wisdom. Literature review concerning harnessing the capabilities of AI in digitizing IKS, translate it into several formats to improve accessibility and visibility, and support language revitalization efforts, was analyzed. The study was guided by Self-Determination Theory and Social Contract Theory which provide crucial lenses for understanding the ethical considerations involved. The findings revealed several factors hindering effective integration of IKS and AI including ethics and social implications. This study further proposed a framework that outlines princi-

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ples and guidelines that provide researchers, policymakers, community leaders and other relevant stakeholders, a platform to develop responsive solutions to culture and equitable. It is recommended that all these parties consider exploring collaborative partnerships and adopt AI technologies for preserving IKS and for long-term sustainability and inclusivity.

INTRODUCTION

Indigenous Knowledge Systems (IKS) present favorable options for cultural preservation, sustainable resource management, and adaptation to climate change, among others (Parlee et al., 2022; Whyte, 2017). Moreover, IKS operate in specificity, where there is no one-size-fits-all, which implies that each indigenous community defines its particular IKS (Todd, 2016; Simpson, 2017) and as such, IKS offer solutions that are adaptable and favorable to many complex problems. It only calls for the recognition, valuing and incorporating IKS as a potential source of infinite solutions to our pressing global issues. However, the existence of IKS is being contested by several factors, which include globalization and marginalization. Marginalization of IKS is not an act that began in this century, where we are witnessing IKS being sidelined in mainstream of technological and scientific discourse, rather, it is just a continuation of what started long ago in history, when colonial practices devalued and suppressed Indigenous knowledge and ways of life (Fryberg et al., 2024). Western knowledge systems were imposed on Indigenous communities, thereby suppressing their languages and cultural practices to favor Western ways of thinking (Smith, 2012). As a result, systemic bias became evident (Reyes-García et al., 2024). Globalization and rapid technological evolution also threaten IKS survival, raising concerns about cultural erosion, data sovereignty, and heritage commodification (Mazzocchi, 2022). It thus, sidelines any opportunity that points towards promoting innovation and fair development (Bremer & Meisch, 2017). Expected norms such as cultural practices and indigenous languages, are also on the decline. Typically, these factors tend to overshadow the rich and diverse knowledge that was developed over generations, thereby blocking the perspectives and practices of indigenous communities. As such, it calls for a re-assessment of knowledge hierarchies along with a commitment to epistemic justice (Shapin, 2018). It is thus vital to recognize the inherent value of IKS, and respect indigenous rights to self-determination (Anderson, 2015).

With the Fourth Industrial Revolution (4IR) bringing together digital, biological, and physical systems, technologies such as Intelligence (AI) and the Internet of Things (IoT) are instrumental in enhancing efficiency, productivity, and interconnectivity (Schwab, 2018; Xu, David, & Kim, 2018). Riding on the potential of AI,