

Metaversal sustainability: conceptualisation within the sustainable tourism paradigm

Tanja Mihalic

Abstract

Purpose – This paper aims to address the novel phenomenon of tourism in the metaverse and analyse possible scenarios that could influence the resilience of a sustainable tourism paradigm in response to this new phenomenon.

Design/methodology/approach – Based on Kuhn's paradigmatic framework, this paper offers an innovative perspective for the integration of new theories and practise-relevant phenomena. It emphasises the relevance and commensurability of different paradigmatic dimensions and outlines the scenarios for the integration of metaversal sustainability.

Findings – The phenomenon of tourism in the metaverse of the 21st century poses a new challenge to the existing paradigm of sustainable tourism, which traditionally focuses on the economic and ecological sustainability of planet Earth's physical environment. The adoption of a metaversal sustainability scenario for the virtual and mixed reality is key to a responsible implementation of the paradigm of sustainable tourism development that considers all its environments, whether fantastic or realistic.

Research limitations/implications – This study has its limitations, as metaversal tourism is still in the experimental phase. A more comprehensive understanding of the metaverse and its terminology is still evolving. There is potential to adapt the sustainable tourism paradigm to new technological environments if the metaverse is recognized as one in the future.

Practical implications – There are practical implications for tourism policy and practise. Tourism stakeholders need to adapt to the changing tourism landscape by recognising the metaverse as a viable environment committed to sustainable development. This will enable innovative strategies to govern, lead, promote and manage metaversal tourism and ensure that it is in line with the long-term goal of sustainability.

Social implications – The metaverse holds considerable potential for transforming social perception and behaviour. Integrating the metaverse into the sustainability pillars of the sustainable development paradigm implies a forward-looking approach that takes into account the dynamics of people's evolving desires and preferences. This inclusion advocates for sustainable development in all environments in which people live and explore.

Originality/value – This research stands out for its pioneering role in advancing a sustainable tourism paradigm that goes beyond the traditional planetary dimensions. By examining the impact of tourism in the metaverse, it proposes a path towards a more holistic and future-oriented paradigm of sustainable tourism in both the physical and virtual worlds. The coining of the term "metaversal sustainability" contributes to the lexicon of paradigms for both tourism and societal sustainable development.

Keywords Sustainable tourism paradigm, Responsible tourism development, Metaversal sustainability, Virtual reality tourism, Digital tourism, Tourism in metaverse, Astronaut tourism, Tourism in universe

Paper type Conceptual paper

Tanja Mihalic is based at the School of Business and Economics, University Ljubljana, Ljubljana, Slovenia.

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元宇宙旅游可持续性：可持续发展范式下的概念化

摘要

方法：基于库恩范式框架，本文为新理论和实践相关现象的融合提供了一个创新的视角。它强调了不同范式维度的相关性和可通约性，并勾勒了元宇宙可持续发展的整合场景。这种概念化在结合了虚拟和物理可持续性环境中被直观呈现。可视化由一个DALL-E OpenAI图像生成器创建的展现游客在虚拟世界的图像补充。

目的: 本文阐述了旅游在元宇宙中的新现象, 并分析了可能影响可持续旅游范式应对这一新现象的弹性的可能情景。

调查结果: 传统的可持续旅游范式侧重于地球物理环境的经济和生态可持续性, 而21世纪旅游现象对现有的可持续旅游范式提出了新的挑战。采用虚拟和混合现实的元宇宙可持续性情景是负责任地实施可持续旅游发展范式的关键, 该范式考虑了所有环境, 无论是梦幻还是现实环境。

研究局限/启示: 由于跨时空旅游还处于实验阶段, 本研究存在一定的局限性。对元宇宙及其术语的更全面的理解仍在不断发展。如果未来的元宇宙环境被视为一种新的技术环境, 那么就有可能发现新的创新的、意想不到的实际解决方案, 使可持续旅游模式适应新的技术环境。

实际意义: 这对旅游政策和实践具有实际启发。旅游利益相关者需要通过认识到元宇宙是一个致力于可持续发展的可行环境, 以适应不断变化的旅游景观。这将使治理、领导、促进和管理元宇宙旅游的创新战略成为可能, 并确保元宇宙旅游符合可持续发展的长期目标。

社会影响: 元宇宙在改变社会认知和行为方面具有相当大的潜力。将元宇宙纳入可持续发展范式的可持续性支柱意味着一种考虑到人们不断变化的欲望和偏好的动态的前瞻性方法。这种包容提倡在人们生活和探索的所有环境中实现可持续发展。

创意/价值: 独创性: 这项研究在推动超越传统地球维度的可持续旅游范式方面发挥了开创性的作用。通过探究旅游在虚拟世界中的影响, 它提出了一条在现实世界和虚拟世界中实现更全面和面向未来的可持续旅游范式的途径。“元宇宙可持续性”一词的创造有助于增加旅游业和社会可持续发展的范式词典。

关键词 元宇宙可持续性, 可持续旅游发展范式, 虚拟现实(VR)旅游, 元宇宙旅游, 数字旅游, 宇宙航天旅游
文章类型 概念型论文

Sostenibilidad del turismo metaversal: conceptualización dentro del paradigma del desarrollo sostenible

Resumen

Planteamiento: Basado en el marco paradigmático de Kuhn, este artículo ofrece una perspectiva innovadora sobre la integración de nuevas teorías y fenómenos relevantes para la práctica. Se destaca la relevancia y conmensurabilidad de las diferentes dimensiones paradigmáticas y esboza escenarios para la integración de la sostenibilidad del metaverso. Esta conceptualización se presenta visualmente en una ilustración que combina entornos de sostenibilidad virtuales y físicos. La visualización se complementa con una imagen que muestra a un turista en el metaverso, creada con el generador de imágenes DALL-E OpenAI.

Objetivo: Este trabajo de perspectiva aborda el novedoso fenómeno del turismo en el metaverso y analiza posibles escenarios que podrían influir en la resiliencia de un paradigma de turismo sostenible en respuesta a este nuevo fenómeno.

Resultados: El fenómeno del turismo en el metaverso del siglo XXI plantea un nuevo reto al paradigma existente del turismo sostenible, que tradicionalmente se centra en la sostenibilidad económica y ecológica del entorno físico del planeta Tierra. La adopción de un escenario de sostenibilidad metaversal para la realidad virtual y mixta es clave para una aplicación responsable del paradigma de desarrollo turístico sostenible que tenga en cuenta todos sus entornos, ya sean ficticios o realistas.

Limitaciones/implicaciones de la investigación: Este estudio presenta limitaciones dado que el turismo metaversal se encuentra todavía en fase experimental. Una comprensión más completa del metaverso y su terminología está aún en evolución. Existe potencial para descubrir nuevas soluciones prácticas innovadoras e imprevistas para adaptar el paradigma del turismo sostenible a los nuevos entornos tecnológicos, si es que el entorno del metaverso se considera como tal en el futuro.

Implicaciones prácticas: Existen implicaciones prácticas para la política y la práctica del turismo. Los agentes del turismo deben adaptarse al cambiante panorama turístico reconociendo el metaverso como un entorno viable y comprometido con el desarrollo sostenible. Esto permitirá aplicar estrategias innovadoras para gobernar, liderar, promover y gestionar el turismo del metaverso, así como garantizar que esté en consonancia con el objetivo a largo plazo de la sostenibilidad.

Implicaciones sociales: El metaverso encierra un potencial considerable para transformar la percepción y el comportamiento social. La integración del metaverso en los pilares de sostenibilidad del paradigma del desarrollo sostenible implica un enfoque prospectivo que tenga en cuenta la dinámica de los deseos y preferencias cambiantes de las personas. Esta inclusión aboga por el desarrollo sostenible en todos los entornos en los que viven y exploran las personas.

Originalidad: Esta investigación destaca por su papel pionero en el avance de un paradigma de turismo sostenible que va más allá de las dimensiones planetarias tradicionales. Al examinar el impacto del turismo en el metaverso, se propone un camino hacia un paradigma de turismo sostenible más holístico y orientado al futuro, tanto en el mundo físico como en el virtual. La acuñación del término “sostenibilidad metaversal” contribuye al léxico del paradigma tanto del turismo como del desarrollo sostenible de la sociedad.

Palabras clave Sostenibilidad metaversal, Paradigma de desarrollo turístico sostenible, Turismo en realidad virtual (RV), Turismo en metaverso, Turismo digital, Turismo astronauta en el universo

Tipo de papel Artículo conceptual

Introduction

The paradigm of sustainable tourism development (in short: sustainable tourism paradigm), firmly rooted in the 20th-century sustainable development principles, has traditionally focused on economic, socio-cultural and environmental (natural) sustainability on our planet (WCED, 1987). However, the 21st century has broadened frontiers, allowing for astronaut travel to universe and virtual travel in the metaverse, which have challenged these established principles.

The metaverse, which is described as a “flourishing” environment with a global “potential for paradigm shifting” (Song *et al.*, 2023, p. 1), is analysed in this perspective paper using Kuhn’s paradigmatic theory and commensurability thesis. The disruptive potential of the emerging metaverse phenomenon leads us to propose an update of the sustainable tourism paradigm and its sustainability pillars. The introduction of the term “metaversal sustainability” (Mihalic, 2023) offers a new perspective on what should be sustained. The inclusion of metaversal sustainability is seen as crucial for the survival of the sustainable tourism paradigm and for ensuring its effective implementation. This paradigm update has profound implications on multiple levels, including the economic, social, cultural, political, environmental, metaversal, educational and research ones.

Sustainable tourism paradigm

A paradigm, or worldview, encompasses a community’s collective understanding in a particular era. It includes perceptions of “what” our world is and beliefs of “how” to behave to achieve goals within a specific cultural and value context. To help assess and monitor the current state of a scientific paradigm, school of thought or phenomenon, Kuhn (1962, p. xiii) outlined a dual framework comprising universally recognised “concepts or theory” and “practice” over time.

Paradigms are dynamic. When we are confronted with new phenomena, alternative concepts (“what”) and solutions (“how”) can emerge, leading to new dimensions or a paradigm shift, provided they are relevant to the community. Kuhn’s commensurability thesis on the coherence of paradigms across conceptual, methodological, perceptual and interdisciplinary dimensions plays a central role in maintaining the stability and resilience of paradigms.

The paradigm of sustainable development, which goes back to the Brundtland Report ‘Our Common Future’ (WCED, 1987), marked a significant shift in the socio-political focus – from neoliberal economic development to a sustainable one. In this new paradigm, the economic environment is only one of those considered, alongside the socio-cultural and natural ones. These widely recognised “pillars of sustainability” are commonly referred to as the 3Ps (profit/progress–people–planet). The Brundtland Report described sustainability as “the spaces in which we live on this planet” (WCED, 1987, Foreword, p. 3). The “paradigmatic side of the 3Ps”, “sustainability”, addresses the question of “what” to sustain within the diverse environments of planet Earth, whereas the paradigmatic side of “development” focuses on “how” to sustain them, aiming to achieve humanity’s goals and increase well-being through technological and social innovation. At the heart of sustainability is an awareness of and commitment to the values of stewardship, responsibility, equity, poverty reduction, international understanding, peace, partnership and prosperity (WTO, 1999; UN, 2015).

The current Encyclopaedia of Tourism (Mihalic, 2022, p. 483) presents the theory and practice of sustainable tourism paradigm, emphasising the commitment to sustainability values (Tribe *et al.*, 2015). Sustainability achievements encompass the 3Ps. Development solutions include responsibility for considering the developmental needs of stakeholders (“visitors, industry and host communities”) and implementing socio-political agendas for sustainable tourism development.

Metaverse and tourism

The metaverse has become a prominent subject and business reality in the 21st century (Song *et al.*, 2023). It integrates virtual reality (VR) and augmented reality, blockchain technology, artificial intelligence (AI), big data and cloud computing, enabling immersive 3-D experiences such as time travel and experiences of historical cultures or natural phenomena (Buhalis *et al.*, 2023). Commercial tourism examples (Gursoy *et al.*, 2022) include Japanese First Airlines virtual flights, National Geographic's virtual kayak tours of the Antarctic icebergs, virtual visits to Machu Picchu and Wander's historical walking tours offered in conjunction with Google Street View.

VR headset devices expand the tourism space by merging real and computer-generated environments into a mixed reality (MR). Whether realistic or fantastical, these realities are increasingly interwoven with the future of tourism. They enable experiences in collective spatial environments in the convergence of physical and virtual environments (Go and Kang, 2022).

The terminology for the emerging phenomenon of "tourism in the metaverse" is still evolving. It is often referred to as "virtual tourism", "VR tourism", "metaverse tourism" and "metaversal tourism" (Buhalis *et al.*, 2023; Go and Kang, 2022, pp. 3, 12; Yang *et al.*, 2023). In contrast to traditional "on-site tourism", it offers an immersive experience through technology. Furthermore, virtual tourism is not synonymous with "digital tourism" or identical to the use of digital technological solutions for travel and tourism, which lack the immersive nature of VR.

Scenarios

Based on Kuhn's perceptual incommensurability thesis, several scenarios relevant to the tourism paradigm can be presented. In a first scenario, the new phenomenon is perceived as digital tourism, which includes electronic or computerised travel experiences through the integration of digital technologies such as digital cameras, digital music and digital marketing. This view is consistent with Brundtland's view of technology as a means to achieving sustainability ("how") but is not commensurable with the perception of the metaverse as a new environment for tourism visits and experiences ("what"). Consequently, this digital technology-centred approach can support a shift towards a distinct technological or smart tourism paradigm with its own values, motivations and interests.

The second scenario goes beyond mere digital perception and recognises the existence of a VR space in which tourism stakeholders engage with computer-generated environments and interact with other users (Metaverse, 2024). This includes immersive visits in VR, online meetings and interactions with avatars and virtual assistants. Consequently, the virtual environment is transforming into an autonomous and socially interactive multi-user platform that has its own ecological (e.g. social and environmental/natural), economic and metaversal impacts on tourism. This perspective requires an extension of the concept of sustainability by recognising the metaverse as a legitimate tourism environment. Consequently, the responsibility for the governance of sustainability (the "how") must be addressed by formulating new agendas, strategies and policies centred on sustainable tourism in this new and evolving technological space.

In contrast to Kuhn's theory of paradigm evolution in relation to new phenomena, the third scenario maintains the status quo of the dimensions of sustainability. In this perspective, sustainable development remains linked to responsibility for the 3Ps of planet Earth. There is no metaverse governance, and it is unknown how or whether this will occur. In particular, the utilisation of the financial potential of the metaverse in tourism is decoupled from the responsibility for its impact on the ecological environment. This approach risks reinforcing the traditional domination of economy over ecology and perpetuating outdated, economically motivated tourism paradigms such as economic development, economic competitiveness, mass tourism and overtourism, which are echoed in tourism in the metaverse.

Tourism impacts

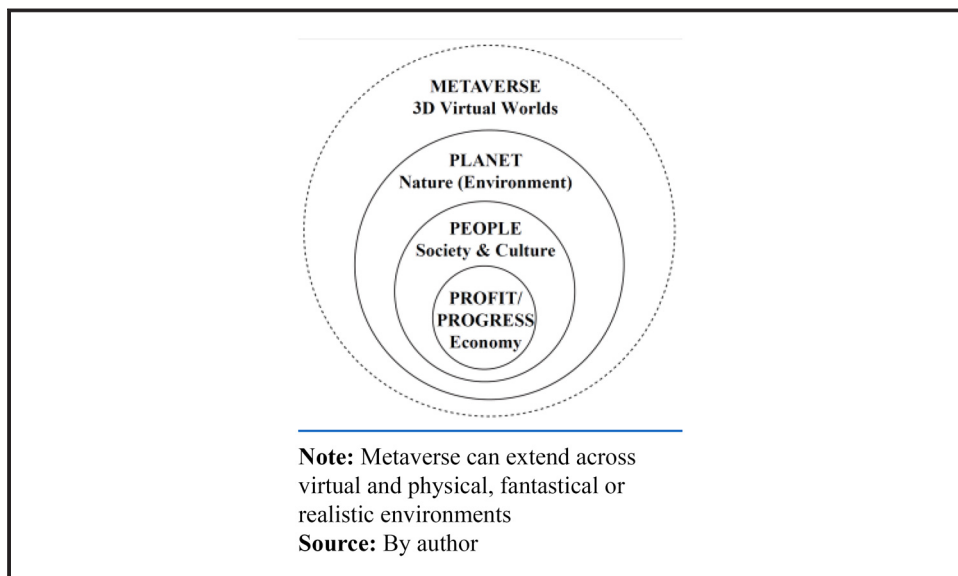
Metaverse tourism use has multiple positive environmental impacts (Wall, 1997). It strengthens virtual and real economies; promotes economic growth, innovation, social interaction, cultural exchange and global unity; expands tourism capacities; and opens new opportunities for (virtual) travel. It can improve real and metaversal destination branding, increase demand for less-visited places and stimulate tourism earnings. It can also improve accessibility and affordability for underprivileged groups and partially or fully replace physical travel.

However, some negative impacts include the exclusion of individuals without access to technology, disconnection from physical reality and psychological issues. Immersive virtual experiences can negatively affect an individual's physical health by weakening the muscles or leading to eye fatigue and postural problems. Negative impacts include cultural homogenisation, loss of diversity and authenticity, promotion of dominant cultures and ethical and legal dilemmas related to the property rights of tangible or intangible counterparts, such as their history. The significant energy and resource consumption of metaversal infrastructure, combined with the waste created by virtual technologies (energy consumption, CO₂ emissions and land use), raises environmental concerns. Furthermore, there are consequences for crime, safety, privacy and data protection, and promoting travel to real-world sites may increase overtourism and the associated environmental problems.

Metaversal sustainability conceptualisation

The conceptualisation of metaversal sustainability builds on the second scenario, which assumes awareness of the metaverse's immersive character, becoming a new virtual space for living and exploration. The quartet of environments shown in Figure 1 represents the expanded conceptualisation of the 3Ps' sustainability, as part of the sustainable tourism paradigm. Terrestrial (also "physical" or "natural" in a broader sense) environments, illustrated as circles with solid lines, have finite capacities, whereas the metaverse, represented by a dashed line, has an unknown or possibly infinite extent. This simple visual representation summarises the coexistence of four sustainability environments.

Figure 1 Sustainability pillars within virtual and physical environments



The environments are interconnected and blend the physical and virtual realities. At its core, the economy, the smallest circle, is nested within society's broader context, and both are encompassed by the largest circle representing nature. This triad exists as interconnected physical habitats on Earth while simultaneously being embedded within the metaverse, symbolising the interplay and coexistence of MRs. [Figure 2](#), generated by an AI image generator ([Open AI, 2023](#)), illustrates a VR tourist experiencing a virtual eruption of Mount Vesuvius in the year 79 AD via VR headsets.

Limitations and future research

The concept of metaversal sustainability faces several significant limitations. One major challenge lies in establishing effective communication between the planet's physical environments and the VR of the emerging metaverse. This involves tackling interdisciplinary questions, such as whether we can measure and compare virtual and material environments to create a commensurable sustainability model. Furthermore, can we effectively manage the impacts of on-site and virtual tourism? How will the new interpretation of Brundtland's "worlds that humans live in" impact the perception of technology in the sustainable development paradigm? The inherent asymmetries among ecological and economic environments, each driven by varying and often incommensurable motives and interests, complicate matters. These challenges raise questions about the applicability of commensurability in these environments, as well as the presence of a critical mass of social and political consensus for the adjusted paradigm.

The proposed sustainability model ([Figure 1](#)) only addresses the "what" (i.e. Kuhn's knowledge "achievements") of the dual framework. Once a new understanding of sustainability is established, the corresponding "how" (i.e. Kuhn's "solutions for practitioners") will follow, opening up opportunities for future research on the practical tourism development. How will the new concept of sustainability affect the landscape of responsible tourism stakeholders? What new interests, motives and perceptions might emerge? How should agendas, policies and innovations for effective sustainable tourism development in VR and MR be designed? The management, regulation and monitoring of metaversal travel also requires attention, as do considerations for defining and counting tourists and day-trippers in virtual space. Governance and management approaches for tourism development in MRs and their impacts must be researched and developed.

Figure 2 Tourist in the metaverse, experiencing a virtual eruption of Mount Vesuvius in the year 79 AD



Source: By author

This study advocates for sustainable tourism and its VR metaversal sustainability adaptation. However, our argument supports a broader societal approach to sustainable development rather than advocating tourism-specific adaptation. We envision societal paradigmatic evolution to capture the emerging VR as a “flourishing metaverse environment” (Song *et al.*, 2023, p. 1). If the societal paradigm of sustainable development is updated, a corresponding adaptation of the sustainable tourism paradigm will follow, guiding its “what” and “how”.

Conclusion

This research is a fundamental step in advancing our understanding and practical implementation of the evolving paradigm of sustainable tourism, which encompasses both the physical and virtual realms. Based on Kuhn’s paradigmatic theory, it advocates the recognition of metaversal sustainability, which is crucial in the 21st century but is not considered either in the prevailing sustainable tourism paradigm or in our societal sustainable development one. Recognising the metaverse as a space (environment) for sustainable tourism enables stakeholders to advance responsible tourism beyond the traditional 3P framework and promote leadership and impact management across different environments – planetary, extra-planetary, physical, virtual, mixed, fantastical or realistic.

This perspective paper also coins the new term “metaversal sustainability” to establish it within the paradigm of sustainable tourism, thus contributing to a field terminological lexicon. As the terminology is still evolving, other terms may prevail, such as “virtual sustainability” or “VR sustainability”, as opposed to the sustainability of planetary physical environments. Opening the discussion on environments that humans live in and explore may open the question of extra-terrestrial space of “astronaut tourism” or “tourism in the universe”, which is also evolving. How will “space technology” and “immersive technology” development and impacts be governed? Future research should investigate the validity and applicability of new environments by exploring different scenarios and commensurabilities of the new concepts. It is important to understand and recognise all forms of tourism and their impacts (both positive and negative) in all possible environments to move sustainably and responsibly in the new realities.

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About the author

Tanja Mihalic is a Professor at the Department of Economics and Head of Tourism Institute and Erasmus Mundus European Master in Tourism Management program at the School of Economics and Business at the University of Ljubljana, Slovenia. Her research and publishing interests include tourism economics and management, environmental economics, sustainability, responsibility and educational and tourism industry values. She has experience in developing tourism educational and research programs and as adviser in sustainable and responsible tourism to national governments, EU and global bodies. She is also an expert evaluator for the European Commission and a fellow of the International Academy for the Study of Tourism. She was a member of the UNWTO World Committee on Tourism Ethics and a board member of the International Association of Tourism Economics. She is a co-editor or active member of editorial boards of many academic journals. Tanja Mihalic can be contacted at: tanja.mihalic@ef.uni-lj.si

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