Travel into my future: perceptions of Generation Z along a fictive journey

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Abstract

Purpose – *This paper aims to reveal Generation Z's perspectives on their distant (2070s) future considering technological, socioeconomic and environmental challenges. This approach reveals latent fears and expectations of this generation and thus highlight key paths for further scientific analysis and strategy development in the tourism sector (e.g. keeping AI development under control, adapting to climate change).*

Design/methodology/approach – *The relevant literature was reviewed using the rapid evidence assessment (REA) framework. The empirical research follows a hybrid approach, employing Grounded Theory (GT) to analyze self-reflective narratives of Generation Z university students (*n *= 150). Subjects imagined themselves in 50 years and reported a fictive journey's technological, sociodemographic and infrastructural characteristics. For the analysis, the three-phase coding process of Corbin and Strauss (1990) was applied to identify patterns in respondents' future perceptions. Findings are validated by employing a cluster analysis using the NVivo software.*

Findings – *The GT-based analysis resulted in a six-variable model identifying key technological (e.g. the rise of AI and smart tourism services), social (e.g. anticipated health challenges) and environmental factors shaping future travel behavior. This study also brings attention to previously underexplored concepts, such as the negative perceptions of technological advancements and Generation Z's concerns about aging, leading to the introduction of new theoretical perspectives (e.g. AI detoxification tourism, negative perceptions of seniority) that could shape the future of consumer behavior.*

Research limitations/implications – *The analysis is based on a sample of Hungarian university students, which may limit generalizability to other cultural or socioeconomic contexts. While the research offers theoretical contributions to future tourism studies, further quantitative validation is recommended, particularly through cross-cultural comparisons and longitudinal studies tracking possible generational attitude changes.*

Practical implications – *Our findings provide valuable insights for tourism stakeholders. In destination management, the integration of AI-based tourism services should prioritize hybrid solutions, ensuring that human interactions remain available for travelers seeking authenticity. Future marketing strategies should balance high-tech convenience with nostalgia-driven travel preferences, acknowledging Generation Z's growing demand for AI detox experiences. In terms of policymaking, regulations should promote sustainable AI adoption in tourism, ensuring ethical data use, accessibility and intergenerational inclusivity. By incorporating these insights, tourism professionals can better align future strategies with the evolving preferences of Generation Z travelers.*

Social implications – *With a deeper understanding of Generation Z's concerns and expectations, this research highlights emerging generational differences in tourism consumer behavior. Findings suggest that digital literacy, climate awareness and AI skepticism will play crucial roles in shaping future travel decisions. This knowledge can boost educational initiatives, policy frameworks and intergenerational travel planning strategies, ensuring that tourism remains inclusive and adaptable to evolving consumer expectations.*

Originality/value – *Our findings provide novel insights into the relationship between tourism, technological development and generational shifts, offering a long-term perspective on how Generation Z envisions travel in an AI-driven world. Unlike previous studies that primarily examine short-term technological adoption in tourism (e.g. AI chatbots, smart hotels or VR experiences), this research explores deeper psychological and sociocultural influences, including climate anxiety, nostalgia-driven travel and AI skepticism. Through the application of GT methodology, this study not only identifies emerging travel behaviors and concerns but also introduces new conceptual frameworks, such as AI detoxification tourism and the paradox of high-tech vs traditional travel preferences.*

Keywords *Distant future of tourism, Grounded Theory (GT) analysis, Generation Z, Industry 4.0*

Paper type *Research article*

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1. Introduction

Today's socioeconomic environment is encountering remarkable challenges. The rapid spread of Industry 4.0 solutions and ongoing socioeconomic and environmental transitions have made it increasingly difficult to formulate accurate visions of the future. This uncertainty is particularly evident in the tourism sector, where evolving consumer behaviors and disruptive technological innovations continuously reshape industry dynamics (Ukpabi and Karjaluoto, 2017).

Following the downturn caused by the COVID-19 pandemic, international tourism in 2024 showed a strong recovery, with around 1.4 billion international tourist arrivals, an 11% increase compared to 2023, reaching 99% of pre-pandemic levels (UNWTO, 2024). Global tourism receipts rose to US$1.6 trillion, surpassing 2019 levels by 4% (UNWTO, 2024). These figures underscore tourism's resilience and its vital role in global economic growth. However, while short-term recovery indicators suggest stability, the sector faces profound long-term challenges that extend beyond economic fluctuations. The rapid integration of AI, automation and immersive digital experiences is set to fundamentally alter how people engage with tourism in the coming decades. At the same time, climate change, demographic shifts and evolving societal values will redefine travel motivations and accessibility.

Building on this perspective, this paper explores the long-term evolution of the tourism sector, examining how technological, environmental and social transformations will shape travel patterns in the future. As part of this research, 150 Generation Z (Gen Z) future tourism professionals were asked to write self-reflective narratives envisioning their future travel experiences. Generation Z, typically defined as those born between 1995 and 2010 (Dolot, 2018), represents the first cohort to grow up entirely in the digital age. This generation is characterized by high levels of digital literacy, constant connectivity and a strong preference for personalized, on-demand services (Robinson and Schänzel, 2019). In the tourism context, Gen Z travelers tend to favor immersive experiences over material possessions, demonstrate a willingness to experiment with emerging technologies and place a growing emphasis on sustainable and ethical travel practices (Gardiner *et al.*, 2014; Orea-Giner and Fusté-Forné, 2023). These present-day characteristics form the baseline for exploring how Gen Z imagines its own travel behavior in later life, allowing for a nuanced understanding of the continuity and transformation of generational preferences over time.

Based on this, our study aimed to identify key travel-related themes emerging from expected life-stage changes, particularly how Gen Z envisions the socioeconomic, environmental and technological context of their future journeys as elderly tourists. Their narratives covered technological innovations (e.g. healthcare in tourism), social factors (e.g. self-image) and environmental challenges (e.g. disappearing destinations). Using Grounded Theory (GT; Corbin and Strauss, 1990), we analyzed patterns and relationships among these themes, identifying underexplored sociotechnological transitions in future tourism research. This study not only provides insights into Gen Z's current expectations and concerns but also outlines potential directions for tourism development, offering valuable contributions to academic discourse.

While the 2070s may appear distant, the intention of this research is not to predict the exact state of tourism in that decade, but rather to explore how current latent attitudes, concerns and aspirations among Generation Z might evolve over the life course. Many of the technological, environmental and social themes that emerged (e.g. as skepticism toward excessive AI penetration) are already present in emerging form today. By projecting them into a distant future scenario, we aim to amplify and better understand these patterns, which may shape not only long-term possibilities but also near-term strategic decisions in the tourism sector.

The structure of this paper is as follows: Section 2 presents a comprehensive literature review on current technological, environmental and social trends that could shape the future of tourism. Section 3 details our methodology, including the principles of GT and the quantitative techniques incorporated into our research design. Section 4 presents findings based on the three-level coding of the GT methodology, emphasizing key patterns and thematic correlations. Finally, Section 5 discusses theoretical and practical implications, along with the study's limitations and directions for future research.

2. Literature review

This study examines technological, environmental and socioeconomic trends concerning the future of tourism. Industry 4.0 (the fourth industrial revolution) is shaped by the rise of artificial intelligence (AI), robotics, big data analytics and the internet of Things (IoT) in several industries, including tourism (Xu *et al.*, 2018). In tourism, Industry 4.0 enables AI-powered customer service, smart destinations, automated travel planning and immersive virtual experiences (Buhalis and Karatay, 2022). Another related concept is metaverse tourism, which involves virtual and augmented reality (VR/AR) technologies to create immersive, interactive travel experiences without physical displacement (Zainal Abidin *et al.*, 2025). Additionally, sustainable tourism referring to travel practices that minimize environmental impact, promote local community well-being and ensure the long-term viability of tourism destinations (Persson-Fischer and Liu, 2021). These concepts might collectively shape the transformation of the tourism sector over the coming decades. To identify the significance of these factors, especially from a Gen Z perspective, a rapid evidence assessment (REA) was carried out in accordance with the guideline provided by the Center for Evidence-Based Management (CEBMA) (Barends *et al.*, 2017) (Figure 1).

First, the research background (academic literature focusing on the future of tourism) and the REA question (*What is known in the scientific literature about the future of tourism, and the perception of Gen Z about it?)* was formulated. Then, the inclusion criteria and study selection were determined, as seen in Figure 1. For the identification of relevant manuscripts, we conducted a two-phased search on the Web of Science (WoS) platform. In the first phase, we employed multiple keywords and Boolean operators ("tourism" AND "travel" OR "future"). The first search yielded 1,041 records. During the data extraction, using the Vos Viewer software, we clustered and visualized the results (Vos Viewer settings: counting method: binary; minimum number of occurrences of a term: 5; 60% of the most relevant terms are selected) (Figure 2).

The outcome revealed two major identifiable groups: a neurobiological approach (mental time travel) and manuscripts related to management. Considering the research perspective, the latter was deemed relevant, and thus, further analysis focused on this cluster. Due to the high number of hits, we narrowed down the search criteria ("tourism" OR "travel" AND "future" AND "generation"), which limited the results to 39. Using the Vos Viewer software, we also examined the clusters of the manuscripts along with the same Vos Viewer settings as previously.

Based on the second data extraction (Figure 3), manuscripts can be grouped into three clusters, focusing primarily on the impact of technological development on tourism (1), the study of consumer groups according to generational marketing (2) and theorizing about tourism consumer behavior (3). In the next phase, we reviewed the abstracts of the retrieved manuscripts and further filtered the relevant literature, resulting in a final selection of 30 papers for the analysis. Subsequently, we thoroughly read the selected manuscripts and synthesized them according to 4-aspect criteria (*see table in Appendix*). Based on the synthesis, the analyzed manuscripts were published between 2002 and 2023, mainly in SJR-listed (Q1, Q2) journals, but a few chapters from study collections also passed the screening dealing with travel decision-making – Walia and Jasrotia (2021), future travel planning – Loi (2016) and the future role of mixed reality (MR) – Buhalis and Karatay (2022). Regarding geographical scope, high diversity can be detected (secondary and empirical studies across Europe, Asia, North America and Australia), which strengthens the generalizability of the results.

During the analysis, several systematic literature reviews were found, mainly containing time series or trend analysis related to the sector (Bowen and Whalen, 2017; Lai *et al.*, 2018; Otoo and Kim, 2020) and discussing smart tourism (Borges and Tiago *et al.*, 2022), especially the tourism implications of radical technological advancements, such as the rise of metaverse (Go and Kang, 2023; Yang and Wang, 2023), virtual reality (VR-), augmented reality (AR-) and MR-based solutions (Huang *et al.*, 2023; Nannelli *et al.*, 2023; Yang and Wang, 2023), and the role of AI (Buhalis and Karatay, 2022; Manthiou and Klaus, 2022; Zeqiri *et al.*, 2020; Bilińska *et al.*, 2023). Regarding the Industry 4.0 solutions, the papers identify additional research areas, including Big

Figure 1 Rapid evidence assessment (REA) – main steps, search and analysis criteria. Source: Authors' own editing, based on Barends *et al*. (2017)

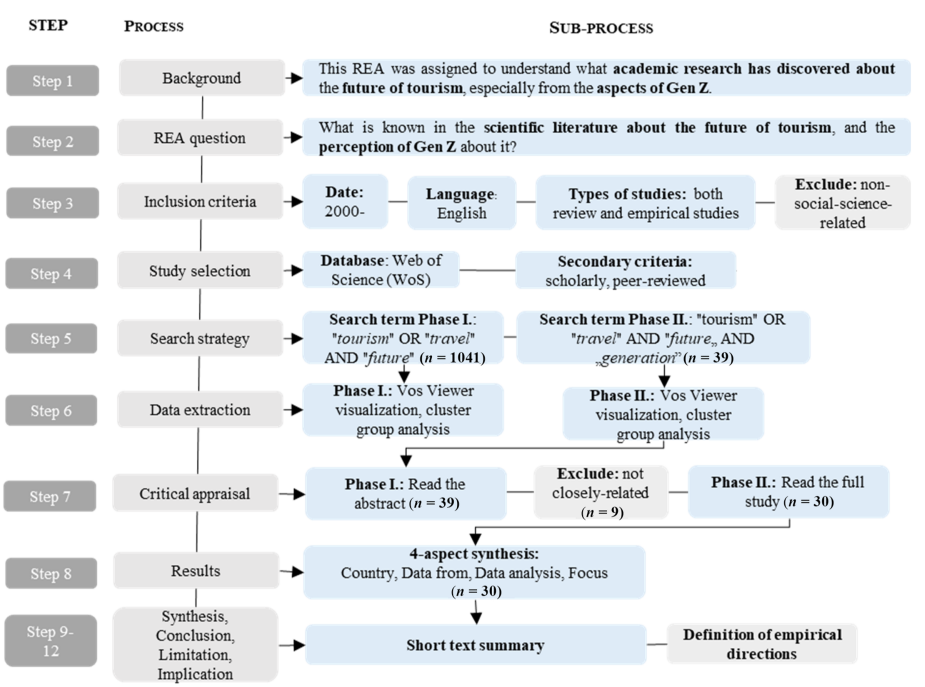
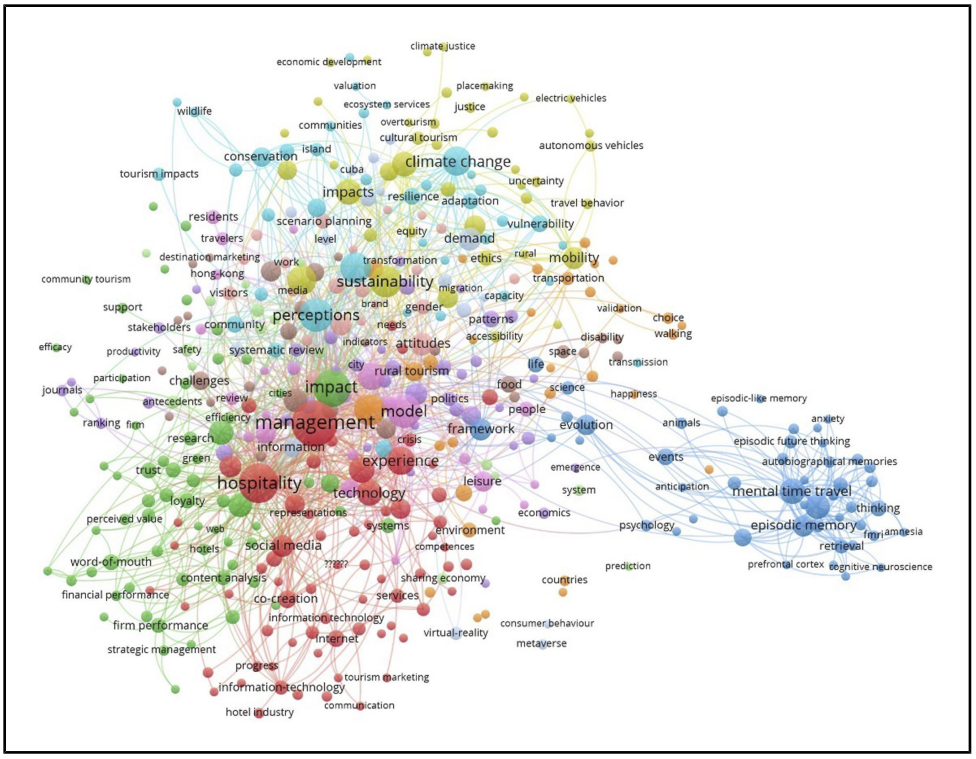


Figure 2 Web of Science (WoS) search Phase 1 – clusters of manuscripts. Source: Authors' own editing, based on the Vos Viewer analysis

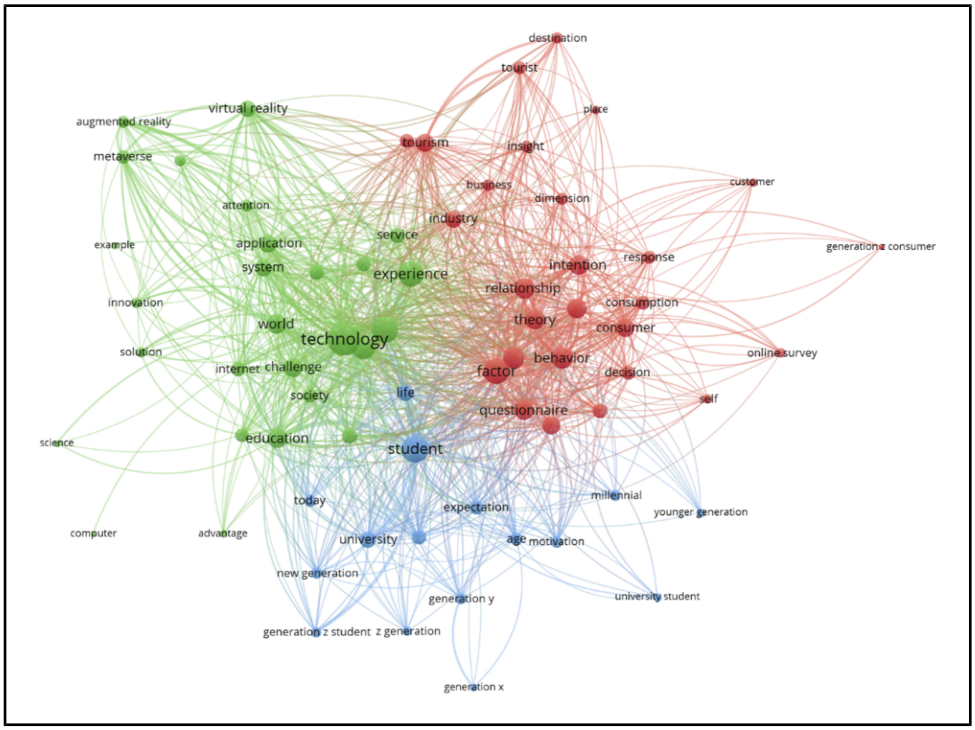


Data for demand forecasting and customer satisfaction, AR and VR for co-creation processes and the rise of service robots in tourism (Palrão *et al*., 2023). Related to metaverse tourism, key findings suggest that technology might not only enhance customer experiences but also converge reality and virtuality, altering paradigms and the definition of tourism experiences. In the context of the future of tourism, the rise of space tourism was also highlighted (Van Pelt, 2002), which may become a new niche product in the sector in the coming decade (2030s).

Regarding consumers, manuscripts generally follow the typology of generational marketing. Some previously published studies (Gardiner *et al*., 2014; Glover, 2009; Glover and Prideaux, 2008; Otoo and Kim, 2020; Şchiopu *et al*., 2016; Baltescu, 2019) examine travel decisions and preferences from the perspectives of Baby Boomers, Gen X and Gen Y, using both qualitative (mainly in-depth interviews or focus groups) and quantitative (online or written surveys) methods. While these studies have extensively analyzed Baby Boomers, Gen X and Millennials (Gardiner *et al*., 2014; Glover, 2009), most findings remain focused on near-term behavioral insights. On the other hand, recent studies demonstrate that generational characteristics fundamentally shape the industry outlook for the next 1–2 decades and suggest that Gen Z's role may be quite similar.

For Gen Z research, conventional data collection and analysis tools dominate (surveys, in-depth interviews, focus groups), but we also identified one paper that employs an alternative qualitative method (narrative analysis) (Haddouche and Salomone, 2018). Telling a tourist experience within the framework of a so-called micro-story (Haddouche and Salomone, 2018) helps to build a symbolic universe and understand the feelings expressed by tourists during unique experiences. Among Gen Z-related studies, the future role of the group as future tourism professionals (Cuic Tankovic *et al*., 2022), the impact of previous decision-making on tourism-related consumption (Robinson and Schänzel, 2019), technology-addiction and its impacts on the well-being of Gen Z (Saneinia *et al*., 2022); gamification in tourism and analysis of its potential (Skinner *et al*., 2018; Olson and Ro, 2021) are the most important fields of interest.

Figure 3 Web of Science (WoS) search Phase 2 – three clusters of related manuscripts. Source: Authors' own editing, based on the Vos Viewer analysis



Based on the findings analyzed, Generation Z already exhibits distinctive tourism behavioral patterns that differentiate them from previous cohorts. They are highly responsive to *digital tools* such as AI-powered trip planning, online peer reviews and real-time booking platforms, while also valuing authenticity, local culture and environmental responsibility in their travel choices (Buhalis and Karatay, 2022; Haddouche and Salomone, 2018). Studies indicate that Gen Z's tourism decisions are shaped by a blend of hedonic motivations (e.g. seeking unique, shareable experience) and utilitarian considerations, including cost-effectiveness and convenience (Skinner *et al.*, 2018; Saneinia *et al.*, 2022). These preferences, combined with their role as digital natives, position Gen Z as both early adopters of tourism innovations and as potential drivers of resistance to over-automation, making them a critical group for future-oriented tourism research.

In addition to technological drivers, long-term *socioeconomic trends* are expected to significantly influence tourism demand, accessibility and destination competitiveness. Demographic aging will increase the importance of age-friendly infrastructure and health-related tourism services (Gardiner *et al.*, 2014). Urbanization will intensify pressures on infrastructure in major cities while generating opportunities for cultural and business tourism (UNWTO, 2023). Income inequality and changing global economic balances may affect travel affordability and the geographical distribution of tourism flows (UNWTO, 2024). Labor market transformations, including the rise of automation and platform-based work in tourism, will reshape both service delivery and career opportunities for future tourism professionals (Jászberényi *et al.*, 2022). These socioeconomic forces form an essential part of the future tourism landscape and provide important context for understanding how Generation Z imagines its own travel behavior later in life.

Concerning the future of tourism, several manuscripts address the current *environmental issues* of the sector (Jourdan and Wertin, 2021; Çalışkan, 2021; Orea-Giner and Fusté-Forné, 2023), emphasizing the role of Gen Z as a driver of sustainable tourism-creation. Beyond addressing current environmental issues, these studies also highlight the increasing demand for sustainable tourism solutions. Çalışkan (2021) emphasizes the adaptive nature of sustainable tourism and the

critical role of Generation Z in shaping its future. Jourdan and Wertin (2021) discuss the long-term implications of climate change for tourism, stressing the need for industry-wide adaptation strategies. Furthermore, Orea-Giner and Fusté-Forné (2023) explore the ethical consumption patterns of Gen Z tourists, demonstrating their preference for environmentally responsible travel choices. These findings collectively suggest that sustainability is not merely an external pressure on the tourism sector but a key factor actively shaping consumer behavior and industry trends.

Overall, the REA process suggests that several technological, social and environmental aspects have been investigated concerning the future of tourism, but the forecasts and findings primarily focus on the near future (up to 2030). Although research on Gen Z in the context of tourism is quite developed, these *papers mainly focus on current consumer insights*. Based on the results, the exploration of how Gen Z envisions the *distant future* of tourism and tourism-related technologies remains an understudied area. Another open question is how Gen Z sees their elderly years and consumption patterns in this distant future. Based on the findings, we have identified research gaps along three open questions (RQs):

RQ1. Which technological advancements do Generation Z participants anticipate in the distant future, and how do these align with themes identified in the existing tourism literature?

RQ2. How does Gen Z envision the future of tourism, and what processes facilitate or hinder their engagement in tourism-related travel?

RQ3. How does Gen Z see themselves in the distant future (especially in view of their changing life situation), and what aspects mostly frame their perception of tourism-related travel?

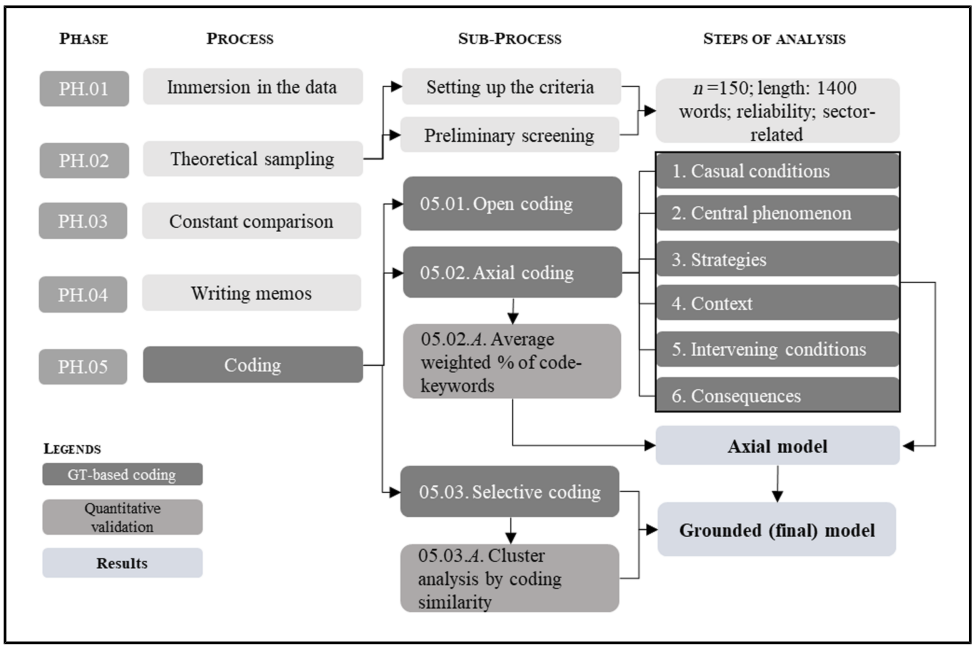
3. Research design

Based on the REA process, we decided to conduct research about the distant future of tourism, focusing on the perceptions of Generation Z. For this, our research design primarily adopts a qualitative approach. Due to the specificity of the topic, we opted for alternative qualitative data collection, which involved writing self-reflexive essays. For the analysis, the GT methodology was employed, following the three-level coding process provided by Corbin and Strauss (1990). To increase the accuracy of our qualitative analysis, we added an additional statistical test uniquely designed to refine and validate insights from the GT approach. To enhance the transparency and validity of the qualitative coding process, the GT approach was supplemented with specific quantitative techniques designed (see: Phase 05.02–03.A). These included: (1) word frequency analysis in NVivo to identify high-occurrence keywords linked to open codes; (2) weighted percentage (WP) calculation to estimate the relative importance of each code, enabling a semi-quantitative prioritization of variables; and (3) cluster analysis using Pearson correlation coefficients to examine relationships between axial codes and validate the grounded model structure. The research process consists of five steps (PH.01 – PH.05 – Figure 4), outlined below.

3.1 Data collection

Data was collected from a sample of university students ($n = 150$) from Hungary's top-ranked private university specializing in business and social sciences (Corvinus University of Budapest – QS World University Ranking, 2025). The students were selected based on their previous high academic performance (minimum GPA of 4.0 on a 4.0 scale), ensuring engagement with sector-specific knowledge. Eligibility criteria included age group compliance (Generation Z, born between 1995–2010; Dolot, 2018) and enrollment in the second year of a tourism and hospitality bachelor program. This ensured that participants possessed foundational expertise in tourism sector dynamics. The average age of the respondents was 22 years old. Participants were recruited via targeted invitations within the university's tourism and hospitality faculty, prioritizing

Figure 4 Research design – main phases. Source: Authors' own editing



students with high academic performance and relevant coursework experience. Participation was voluntary, without financial or academic incentives.

An essay-based qualitative data collection method was chosen to capture deep, reflective insights into future tourism expectations. Participants were instructed to compose a forward-looking essay (1,400–1,600 words) envisioning their personal travel experiences in 50 years (2070s). The essays were required to integrate personal perspectives while having references to tourism sector dynamics, technological advancements and socioenvironmental influences. This method was preferred over structured interviews to allow for greater narrative freedom and creativity, essential in exploring perceptions of an uncertain, distant future. The essays were written in Hungarian and submitted in docx format to maintain consistency in data processing.

Following data collection, the essays were imported into NVivo Qualitative Data Analysis software (version 12, with a license provided by the researchers' affiliation). A multi-step coding process was employed using the GT approach, with three-level coding (open, axial and selective coding) applied to identify emerging themes. Inter-coder reliability checks were conducted to ensure analytical reliability, with a second researcher reviewing a subset of the coded data. Integrating NVivo software allowed for structured textual analysis, clustering of key themes and validation of patterns emerging across the dataset.

3.2 Data analysis – Grounded Theory (GT) method

GT was originally developed by sociologists Glaser and Strauss (1998) and has since evolved into multiple methodological approaches. This study primarily follows the Corbin and Strauss (1990) variant, which incorporates systematic coding and theoretical sampling. Additionally, it draws on Charmaz's (2006) constructivist GT perspective, particularly in its emphasis on capturing subjective, future-oriented narratives through reflexive engagement with the data. The GT process was further complemented by quantitative validation, ensuring a mixed methods approach that enhances the reliability of the findings.

The analysis followed a structured five-step process:

PH.01 – Immersion in the data: A systematic literature review was conducted to provide context for the empirical research (see Chapter 2).

PH.02 – Theoretical sampling: In this phase, primary data collection is required until the theoretical saturation, i.e. to identify as many factors as possible that determine visions of the future and thus the realization of future tourism trips. To achieve this, a relatively high number (n = 150) of participants was involved in the research.

PH.03 – Constant comparison: In this case, the adequacy of narratives is checked (e.g. text coherence, inclusion of any future references and realistic visions of the future based on the immersion in the data – PH.01). Following the preliminary screening, all documents were found to be suitable for the analysis.

PH.04 – Writing memos: As the next step, researchers identify patterns in the documents. Memos include research ideas created during the constant comparison, which support the coding process.

PH.05 – Coding: The analysis employed a three-level coding process (open, axial, selective coding) based on Corbin and Strauss (1990), which consists of the following steps:

PH05.1 – Open coding: The process of creating influencing categories (variables) without limitations.

PH05.2 – Axial coding: The process of defining the relationships between open codes and indicating them in an axial (preliminary) model following an advanced (six aspect) coding criterion:

Causal conditions: factors that cause or influence the central phenomenon (in this case, external conditions that affect tourism) are classified here.

Central phenomenon: the central factor that determines actions. The central phenomenon is the core of the theory.

Strategies: the set of actions that are realized by the central phenomenon (e.g. consumer patterns, preferred tourism products).

Context: the set of conditions in which strategies are realized (e.g. premises for subjects to participate in a future trip).

Intervening conditions: broader conditions that facilitate or constrain the strategies (e.g. health-related aspects, technological developments).

Consequences: representing the outcomes of the subjects' actions.

PH.05.02 A – Average weighted percentages (%) of code-keywords: This is an extension to the original GT methodology to check the variables of the axial (preliminary) model based on related keywords and their importance (weighted percentage – WP).

PH.05.3 – Selective coding: It involves the set-up of the grounded (final) model. For this, key variables that will most determine the future travel process are selected.

PH.05.03 A – Cluster analysis by coding similarity: As a further extension to the GT analysis, the validity of the grounded (final) model has also been checked by a cluster analysis to reveal the correlation between variables created during the axial coding.

4. Results

Results are presented along with the three-level coding method (PH.05.1–05.3).

4.1 Open coding

This phase of the analysis is exploratory and unstructured. Researchers review participants' descriptions sentence by sentence, identifying key perceptions. Open coding aims to capture as many variables as possible. In practice, this involves reading the documents while manually recording key themes and observations in an MS Excel table.

4.2 Axial coding

Axial coding was used to structure the relationships between open codes, revealing the key themes shaping future travel perceptions.

4.2.1 Axial code creation. Table 1 lists the codes generated during the open coding and linked to each axial code. To determine the code importance, we ran the command line [Explore → Word Frequency] in NVivo software, which aimed to search for keywords relating to the codes (Wong, 2008). This step aims to reveal the frequency of occurrence of the codes and thus refine the construction of the grounded (final) model. Boolean operators [AND & OR] were employed for the keyword search. During the process, hits [Ref.] and the Weighted percentage (WP) [%] values were considered. Weighted percentages facilitate the decision of how relevant a code is in the documents analyzed (Jackson and Bazeley, 2019). Since each keyword has a different % value, an average value was calculated. Since the specific values of the thresholds strongly depend on the volume of the documents analyzed and the researcher's preferences, there are no generally accepted standard values of weighted percentages. As the number of words in the processed database is very high [approx. 210.000], the average weight percentage values are low. For utilizing the values for further analysis, the following thresholds were defined: Category 1: 0.0001–0.0; Category 2: 0.01–0.1; Category 3: 0.1–1.0. For finalizing the grounded (final) model, it is useful to design the key variables according to the variables belonging to these categories so that the definition of thresholds can have a variable-reducing function. Each code has also been analyzed based on their sentiment. Sentiment analysis aims to identify and evaluate the emotions, moods or attitudes inherent in each text or document (Jackson and Bazeley, 2019). It can be used to determine whether a text has rather a positive or negative emotional content (indicated by + and −).

4.2.2 Path description of axial codes. Figure 5 visually represents the axial coding results. At the *causal conditions (n = 7)* level, codes with the topic of technological progress, climate change and shifting sociodemographic structures were identified as external forces that shape future travel conditions, i.e. the *central phenomenon* (*n* = 1). In response to the central phenomenon, different *strategies (n = 3)* emerge that include seeking for nostalgia, and embracing high-tech, AI-facilitated travel, including space tourism and AI-guided experiences. These strategies unfold within specific *contextual conditions* (*n* = 4), such as previous travel experience, family background, health status and psychological readiness. Beyond these personal factors, *intervening conditions* (*n* = 3) – such as healthcare quality, mobility infrastructure and traveler's age – either support or limit these strategies. Ultimately, these factors lead to distinct *consequences* (*n* = 3). While some envision a future of unlimited travel options enhanced by AI, others express concern about over-reliance on technology and the potential eclipse of human-based travel experiences.

This structured pathway, developed through axial coding, provides the foundation for the following section, where key themes are explored in greater depth, demonstrating how these interconnected factors shape future travel perceptions.

4.2.3 Key topics arising from axial codes. 4.2.3.1 Smart mobility. The future of tourism is expected to be shaped by advancements in transportation. *Autonomous vehicles (SAE 4–5)* [1], *Hyperloop systems*, *drone taxis* and *AI-enhanced mobility services* were frequently mentioned as changes that could reduce travel time and enhance consumer efficiency. Among these, AI-powered tour

Table 1 Axial coding – qualitative validation (SUM of references, average weight percentages (%)) of codes and sentiment analysis

Axial code	*Ref*[1] *(SUM)*	*Open codes*	X_k	X_l	*Boolean operators (keywords)*	*Av. weight percentage*[2] *(%)*	*Importance category*[3]	*Sentiment*[4]
Transport enhancement	124	Widespread of SAE 4–5 vehicles	1	39	"*self-driving*" OR "*autonomous*" OR "*driverless*" OR "*robotic*"	0.0186	Category 2	(+)
		Alternative propulsion	2	72	"*alternative*" OR "*hybrid*" OR "*electric*" OR "*hydrogen*"	0.0343	Category 2	(+)
		Maglev	3	2	"*maglev*" OR "*magnetic levitation*"	0.0010		(+)
		Hyperloop	5	2	"*hyperloop*"	0.0010	Category 1	(+)
		Drones (air taxi)	6	9	"*drone*" OR "*robotaxi*" "*flying taxi*"	0.0043	Category 1 Category 1	(+)
Holographic solutions	61	Client management and information gathering	6	61	"*holographic*" OR "*hologram*"	0.0290	Category 2	(+/−)
Climate anxiety	75	Destination choice and availability	7	75	"*climate* OR "*climatic*" AND "*problem*" OR "*climate change*" OR/AND "*endangered*" OR/AND "*jeopardized*" AND "*destination*" AND "*attraction*"	0.0357	Category 3	(−)
Artificial intelligence	146	Embodiment of humanity	8	8	"*solve*" AND "*health*" AND "*problem*" AND "*disease*" OR "*human advancement*"	0.0038	Category 1	(+)
		Anthropomorphism in robotics	9	42	"*anthropomorphism*" OR "*human-like*" AND "*robot*"	0.0200	Category 2	(+/−)
		VR/AR/MR-based service availability	10	96	"*virtual reality*" OR/AND "*augmented reality*" OR/ AND "*mixed reality*"	0.0457	Category 3	(+)
Perception of health and safety risks from altered climatic conditions	75	–	11	75	"*health*" AND "*risk*" AND "*danger*" AND "*climate change*"	0.0357	Category 3	(−)
Age group isolation possibility	73	–	12	73	"*separation*" OR "*isolation*" OR "*specialized*" AND "*tour*" OR "*travel for the elderly*"	0.0348	Category 2	(+)
Perceived risk over health disparity/need for accessibility	16	–	13	16	"*need*" AND "*accessibility*" OR "*health*" AND "*risk*"	0.0076	Category 1	(−)
Previous travel experience	27	–	14	27	"*travel*" AND "*experience*"	0.0129	Category 2	(+)
Family background	390	–	15	390	"*family*" OR "*husband*" OR "*wife*" OR "*partner*" OR "*child/ren*" OR "*daughter*" OR "*son*" "*granddaughter*" OR "*grandson*" OR "*relatives*" OR "*marriage*"	0.1857	Category 3	(+)
Current health status	45	–	16	45	"*health*" AND "*status*" OR "*problem*" OR "*issue*" OR "*disease*" OR "*illness*"	0.0214	Category 2	(−)
Psychological readiness	7	–	17	7	"*ready for*" AND "*try out*" OR "*experience*" OR "*use*"	0.0033	Category 1	(−)

(*continued*)

Table 1 Continued

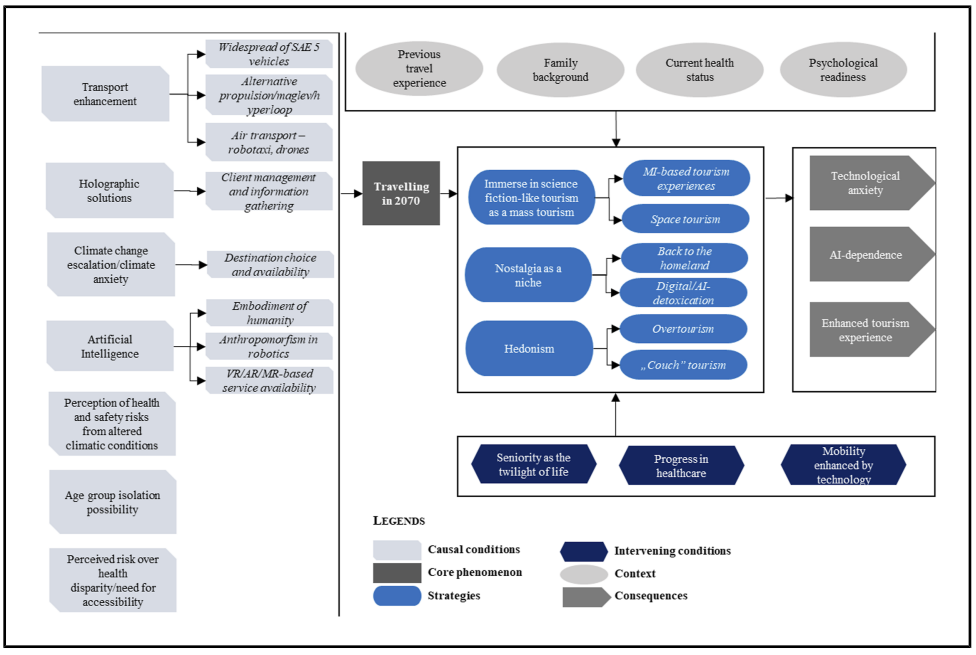
Axial code	*Ref*[1] *(SUM)*	*Open codes*	X_k	X_l	*Boolean operators (keywords)*	*Av. weight percentage*[2] *(%)*	*Importance category*[3]	*Sentiment*[4]
Sci-fi as mass tourism	154	AI-based tourism experience	18	31	"*artificial intelligence* OR "AI" OR/AND "*tourism*" OR/AND "*travel*"	0.0148	Category 2	(+/−)
		Space tourism	19	123	"*space*" OR "*moon*" OR "*spacecraft*" OR "*Mars*" OR "*colonization*"	0.0586	Category 3	(+)
Nostalgia as a niche	52	Back to the homeland	20	34	"*homeland*" OR "*childhood*" OR "*home*" OR "*my country*"	0.0162	Category 2	(−)
		Digital/AI-detoxication	21	18	"*AI*" AND "*refuse*" OR "*get rid of*" OR "*detoxication*"	0.0086	Category 1	(−)
Hedonism	24	Overtourism	22	21	"*overtourism*" OR "*crowdy*" OR "*hordes of tourists*"	0.0100	Category 1	(−)
		"Couch" tourism	23	3	"*couch*" OR "*stay at home tourism*"	0.0014	Category 1	(+)
Seniority as a twilight of life	37	–	24	37	"*old*" AND "*too*" OR "*last years*" OR "*last travel*"	0.0176	Category 2	(−)
Progress in healthcare	30	–	25	30	"*modern*" OR "*developed*" OR "*superb*" OR "*progressed*" AND "*healthcare*"	0.0143	Category 2	(+)
Technological anxiety	26	–	26	26	"*anxiety*" AND "*stress*" AND "*technology*" OR "*fear*" OR "*fright*"	0.0124	Category 1	(−)
AI-dependence	48	–	27	48	"*artificial intelligence*" AND "*depend*" OR "*influence*" OR "	0.0229	Category 3	(−)
Enhanced tourism experience	145	–	28	145	"*tourism*" AND "*experience*" AND "*unforgettable*" OR "*good*"	0.0690	Category 3	(+)

Note(s) [1]Frequency of occurrence of the axial code in the documents analyzed
[2]Average of weight percentage (WP) of open codes. The evaluation value is x_l^k; where k is the number of open codes [1–28] and l is the number of occurrences of open codes. To determine weight percentage (X^j) of a code, the x_l^j values are divided by the total words of documents analyzed (210.000), multiplied by 100 (eq. 1). $X^j = \left\lfloor \frac{x_l^k}{\sum^m} \right\rfloor x100$
[3]Categorization based on the AWP values
[4]Qualitative classification (Sentiment analysis) of the context of an open code based on the tone of voice
Source(s): Authors' own editing

guide vehicles stand out, not only as transport solutions but also as *anthropomorphic travel assistants* providing personalized recommendations. AI-driven transportation is envisioned to provide personalized travel experiences based on real-time data, adjusting routes and services dynamically. Respondents also emphasized the increasing role of *alternative propulsion methods*, such as electric, hydrogen and solar-powered transport, reflecting a growing eco-consciousness among Gen Z travelers.

4.2.3.2 AI-driven tourism services. AI was identified as one of the most powerful drivers of change in tourism, particularly in hospitality management, automated check-ins, AI-based tour guidance and real-time translation tools. AI-driven automation is expected to improve convenience and reduce labor shortages, but concerns were raised about its potential to *erode human-centric experiences*. The concept of *VR-based "couch tourism"* emerged as a significant theme, where advanced virtual reality solutions could allow individuals to explore destinations from their homes. While this was perceived as an accessible alternative to traditional travel, many respondents also

Figure 5 Results of axial coding – axial (preliminary) model. Source: Authors' own editing



feared the *diminishing importance of physical travel experiences*. Additionally, AI-powered *instant translation tools* were highlighted to eliminate language barriers in tourism, transforming international travel into a more seamless experience.

4.2.3.3 Holographic experiences. Holography was another transformative technology expected to reshape tourism. Hotel check-ins, virtual guided tours and historical site reconstructions were key applications envisioned for holograms. Respondents speculated that *holographic projections* could play a vital role in *preserving historical landmarks*, offering immersive experiences of destinations that may be lost due to environmental degradation. An example often mentioned was the potential holographic reconstruction of Venice before its destruction, allowing future generations to experience cultural heritage despite the physical loss of sites.

4.2.3.4 Climate change. Climate change was a recurring concern, with respondents predicting that rising sea levels, extreme weather conditions and environmental degradation will make some destinations unviable. Coastal cities and fragile ecosystems like Venice and coral reefs were frequently cited as high-risk locations. AI-driven *sustainability solutions and conservation tourism models* were proposed as potential mitigation strategies. Additionally, *AI-enhanced climate monitoring* systems could allow travelers to adjust their itineraries based on real-time environmental data, optimizing safe and sustainable travel choices.

4.2.3.5 Aging and social isolation. Aging is frequently associated with declining health and reduced mobility, reinforcing concerns about travel limitations and accessibility needs. Many respondents expressed pessimism about their future travel opportunities, highlighting concerns about physical decline, social isolation and increased dependency on AI-driven tourism services. This highlights the growing necessity for accessible tourism infrastructure. Features such as shorter walking distances, *age-friendly accommodations* and medically equipped travel services were considered essential for ensuring travel inclusivity. However, concerns were also raised regarding climate-related health risks, such as UV exposure and mobility impairments, which may require additional healthcare-oriented tourism solutions. Some respondents also suggested the creation of noise-isolated, senior-friendly sections in transportation, catering to the comfort of older travelers. With increasing digitalization, some respondents anticipated a shift toward "*senior-exclusive*" travel programs, offering quieter and more personalized experiences. However, concerns were frequently expressed about *social disconnection due to*

AI-dominated tourism services, raising questions about the potential loss of personal engagement in future travel.

4.2.3.6 Nostalgia vs high-tech tourism. A significant divide emerged between those who preferred *traditional, nostalgia-driven travel experiences* and those who embraced *high-tech, AI-enhanced journeys*. While some respondents valued authentic, culturally immersive trips, others were drawn to digitally facilitated futuristic tourism experiences. Concerns were raised about *the loss of human interaction and cultural authenticity* in fully automated travel environments.

4.2.3.7 Past travel experiences and destination preferences. Personal history plays a crucial role in shaping future travel preferences. Many respondents reflected on *childhood travel experiences and family traditions*, reinforcing a continued demand for heritage tourism. Others expressed a preference for *destinations they could not visit in their youth*. Regarding future travel preferences, respondents frequently mentioned prominent European capitals (Paris, Rome, Athens), Middle Eastern cultural hubs (Jordan, Israel) and exotic island destinations (Maldives, Madagascar, Puerto Rico, Cuba). Additionally, major US cities (New York, Washington DC, Miami) were among the most cited places respondents wish to explore in the future.

4.2.3.8 Space travel and hedonistic motivations. Once considered science fiction, space tourism is now viewed as an emerging reality. Many respondents believe that *sub-orbital and orbital travel* will be commercially available within their lifetime, although concerns about exclusivity, cost and potential health risks remain prominent. High-adrenaline and extreme tourism experiences are expected to grow in popularity. Respondents predicted an increasing demand for *AI-integrated, highly personalized hospitality services*, including AI-driven concierge services, predictive booking systems and even space-based hospitality experiences.

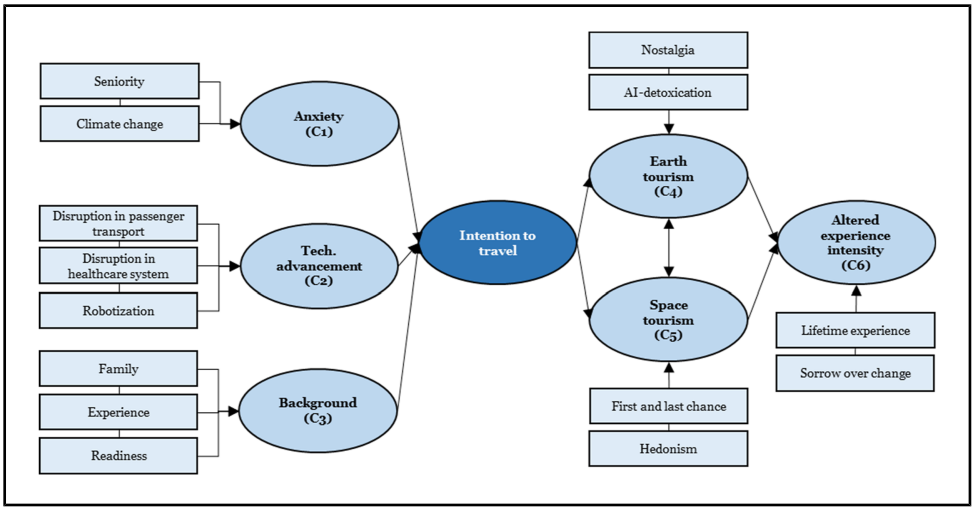
4.2.3.9 Technological anxiety and AI overreliance. While technological advancements in tourism are widely accepted, concerns about *reduced human autonomy*, privacy risks and *dependence on AI-driven decision-making* were frequently mentioned. The risk of *excluding non-tech-savvy travelers* was also noted, potentially leading to a generational divide in tourism accessibility. A recurring concern was that as technology continues to evolve at an accelerating pace, and even *Gen Z may struggle to keep up with future innovations*, leading to a fear of technological dropout.

4.3 Selective coding

During the selective coding, the variables identified in the axial (preliminary) model are used as a starting point, considering the importance of the variables based on the calculated weighted percentage values. First, an arbitrary qualitative model is created based on the researcher's impressions (Walker and Myrick, 2006), which is complemented by the cluster analysis function of the NVivo software to examine the correlation of the codes, thus validating the importance of the variables in the qualitative model.

4.3.1 GT-based coding. Based on the final (grounded) model developed (Figure 6) using a qualitative approach, future travel is shaped by two individual-specific dimensions. First, *Anxiety* (C1) over seniority and the resignation of a radically changing environment largely defines attitudes toward the future of traveling. Besides, the individual's *Background* (C3), given the importance of family members in the senior tourist's travel decision and previous travel experiences determine the perception of future travel impulses. While experience-intensive expectations frame the narratives, *Technological advancement* (C2) is a definite molding factor, especially through innovations in passenger transport, advances in healthcare and AI-based robotization. Two main trajectories for future tourism experiences have emerged: the expectation of conventional experiences (nostalgia-effect) by visiting destinations on planet *Earth* (C4), and new experiences through high-tech solutions, of which *Space tourism* (C5) may be an emerging subfield and framed by the vision for Gen Z as a first and last experience. The output of the model is clearly a completely *Altered travel experience* (C6), which is ambivalent: the future may bring lifetime memories, but this may be overshadowed by the bitterness of a previously unseen burst of development.

Figure 6 Results of PH05.03 – selective coding resulting the grounded (*final*) model. Source: Authors' own editing



4.3.2 Quantitative validation. Cluster analysis was performed using NVivo software [Explore → Diagrams →Cluster Analysis – codes examined: list of PH05.03 coding phase (Figure 7), clustered by: coding similarity, similarity metric: Pearson correlation coefficient) to examine the correlation between identified codes and check the validity of the grounded (final) model constructed (Table 2).

Figure 7 Result of cluster analysis using NVivo software. Source: Authors' own editing based on NVivo cluster analysis

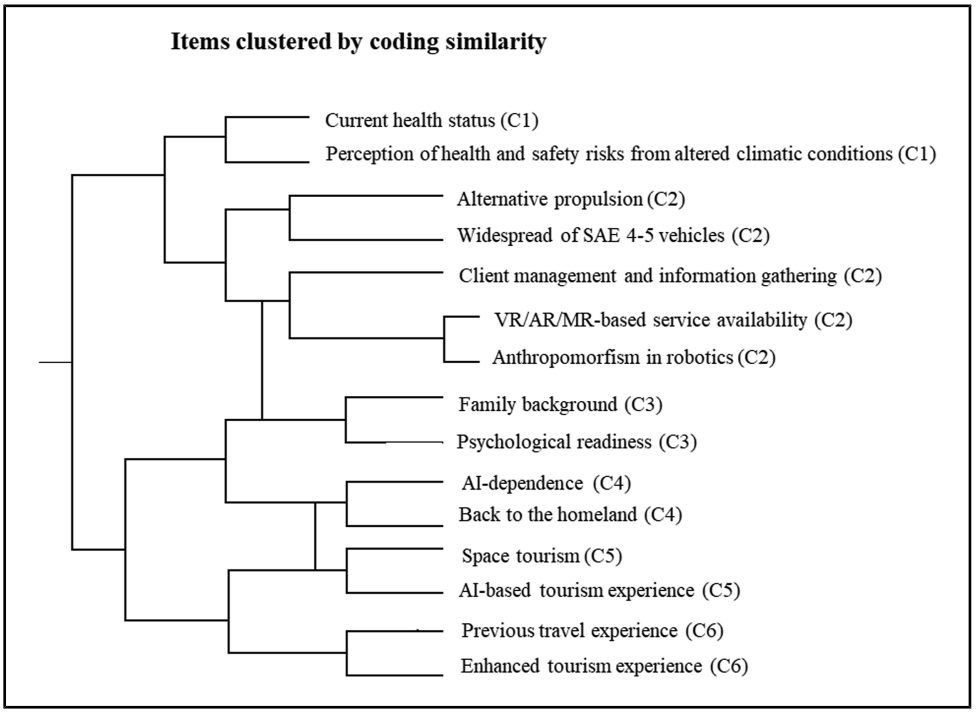


Table 2 Results of cluster analysis (NVivo) – Pearson correlation coefficients

No.	Code A	Code B	*Pearson correlation coefficient*	*Degree of correlation*[1]	*Cluster code*
1	Current health status	Perception of health and safety risks from altered climatic conditions	0.942523	High	C1
2	Alternative propulsion	Widespread of SAE 4–5. vehicles	0.939487	High	C2
3	Client management and information gathering	VR/AR/MR-based service availability	0.900497	High	C2
4	Client management and information gathering	Anthropomorphism in robotics	0.732924	High	C2
5	VR/AR/MR-based service availability	Anthropomorphism in robotics	0.714861	High	C2
6	Family background	Psychological readiness	0.496861	Moderate	C3
7	AI-dependence	Back to the homeland	0.482198	Moderate	C4
8	Space tourism	AI-based tourism experience	0.479319	Moderate	C5
9	Previous travel experience	Enhanced tourism experience	0.474912	Moderate	C6

Note(s) [1] Threshold: +/− 0.50 and +/− 1: high; +/− 0.30 and +/− 0.49: moderate, below +/− 0.29: low (Ott and Longnecker, 2015)
Source: Authors' own editing

The Pearson correlation coefficient obtained from the cluster analysis in NVivo measures the correlation between clusters, ranging from −1 to 1 (Wong, 2008; Allsop *et al.*, 2022). The Pearson correlation coefficient therefore aims to understand the relationship between clusters based on the frequency or occurrence of codes. Cluster analysis has confirmed high or moderate correlations between codes and therefore proved the validity of the grounded (final) model.

5. Discussion and conclusion

This study examined the perceptions of Generation Z regarding future tourism, particularly in relation to technological advancements, environmental changes and personal aspects. Findings highlighted both the enthusiasm for high-tech tourism solutions and a simultaneous sense of nostalgia and concern about future transformations. This paradox underlines the complexity of how digital natives project themselves into an AI-driven, highly automated future.

The research provided the following answers to the research questions (RQs):

RQ1: Which technological advancements do Generation Z participants anticipate in the distant future, and how do these align with themes identified in the existing tourism literature?

Subjects anticipate a strong escalation of Industry 4.0 technologies, mirroring discussions in the literature. AI solutions are expected to dominate the tourism sector, transitioning human-based service into a premium category, while robotic and automated services become the norm. However, this transformation also fuels technological anxiety, as respondents foresee challenges related to over-digitization and reduced human interaction.

RQ2: How does Gen Z envision the future of tourism, and what processes facilitate or hinder their engagement in tourism-related travel?

While curiosity about high-tech tourism – including AI-driven services and space tourism – is evident, a deep longing for traditional, nostalgic travel experiences remains. Climate change

emerges as a major limiting factor, with concerns over environmental degradation impacting both travel opportunities and destination appeal.

RQ3: How does Gen Z see themselves in the distant future (especially in view of their changing life situation), and what aspects mostly frame their perception of tourism-related travel?

Self-perceptions are heavily shaped by negative associations with aging, often seen as a constraint on travel. However, family encouragement and social support are expected to play a crucial role in facilitating travel participation in later years. Despite growing technological conveniences, travel is still viewed as a rare and cherished experience, rather than an easily accessible aspect of daily life.

Overall, this study confirmed that Industry 4.0 technologies – including AI, robotics, virtual reality and autonomous transport – will likely reshape tourism in ways that Generation Z both anticipates and resists. This aligns with Buhalis and Karatay's (2022) insights on smart tourism, but our research extends this by showing how these technologies interact with aging concerns, climate anxiety and digital fatigue. Unlike previous studies focusing on immediate AI adoption, this research reveals a more ambivalent long-term perception, where AI is seen both as an enabler and a potential disruptor of human-centered tourism.

Furthermore, our findings align with previous research highlighting how AI-driven personalization and immersive VR technologies in smart tourist destinations (Florido-Benítez and del Alcázar Martínez, 2024) enable seamless and hyper-personalized travel experiences. At the same time, the increasing reliance on automation and biometric technologies, such as facial recognition (Gupta *et al*., 2023), raises concerns about data privacy, ethical AI implementation, and the potential alienation of travelers who prioritize human interaction. While these studies emphasize the growing role of automation in tourism, our research extends this perspective by revealing a generational paradox: despite being digital natives, many Gen Z travelers express techno-skepticism and a desire for travel experiences that maintain a balance between technological convenience and human engagement.

This study also highlighted that climate change is a central concern shaping travel decisions, reinforcing previous sustainability research (e.g. Orea-Giner and Fusté-Forné, 2023). However, unlike prior studies that focus solely on sustainable travel choices, this research indicates that climate-induced nostalgia and the desire for "last chance tourism" will become major emotional drivers in future travel.

5.1 Theoretical contributions

This study provides a novel theoretical framework for understanding the long-term evolution of tourism by exploring how Generation Z envisions travel 50 years from now. While previous research has primarily examined short-term technological trends and AI adoption, this study shifts the focus toward deeper psychological, social and environmental transformations that will shape future tourism behaviors. By analyzing distant future tourism scenarios, it extends beyond conventional forecasting methods and integrates both technological optimism and generational concerns about automation, aging and climate change. The study's originality lies not only in its thematic scope but also in its interdisciplinary approach, bridging future studies, tourism theory, and generational identity research.

Beyond its thematic contributions, this study introduces key theoretical concepts that broaden current discussions in tourism research and provide a foundation for future empirical work. Among the most significant contributions are:

1. *AI detoxification tourism* – as an extension of digital detoxication, this study confirms the increasing preference for AI-free travel experiences as a response to digital fatigue and the growing dominance of AI-driven services. This concept challenges existing models of smart

tourism, suggesting that automation may not be universally accepted but instead lead to niche markets for human-centered, low-tech travel.

2. *Fear of dropping out and techno-skepticism* – this study highlights a rising concern among Gen Z travelers regarding the accelerating pace of technological change. While they are digital natives, many fear they will struggle to keep up with future innovations, leading to potential exclusion from next-generation travel experiences and AI-dominated services. These finding nuances existing technology acceptance models, indicating that future travelers may not adopt AI and automation as seamlessly as previously assumed.

3. *Human-centered progress* – despite their fluency in digital environments, the analysis reveals that Gen Z resists excessive automation, instead prioritizing human interaction in tourism experiences as a means of preserving authenticity. This contributes to debates on the balance between efficiency-driven smart tourism and experiential, human-centric travel models.

4. *Negative perceptions of seniority* – an unexpected finding was the overwhelmingly pessimistic view of aging among respondents. Rather than seeing later-life travel as an opportunity for exploration, many associated seniority with physical decline, social isolation and limited accessibility, raising concerns about how future tourism services will cater to an aging population. This challenges traditional life-course tourism models by suggesting that Gen Z foresees more barriers to senior travel than previous generations.

Methodologically, this study advances GT research by integrating quantitative validation techniques, an approach rarely applied in traditional GT studies. While GT relies on qualitative inductive reasoning, this research incorporates cluster analysis and weighted percentage calculations to empirically validate thematic patterns, offering a structured approach to identifying dominant trends. This fusion of qualitative depth with quantitative precision enhances the credibility of the findings and strengthens the reproducibility of GT-based tourism research. By demonstrating how mixed-methods approaches can refine qualitative modeling, this study provides a methodological blueprint for future explorations of long-term tourism behavior.

5.2 Practical implications

Beyond its theoretical advancements, this study provides essential practical insights for tourism professionals, policymakers and industry stakeholders seeking to navigate the evolving landscape of future travel. As AI, automation and digital tourism solutions become more prominent, a balanced approach integrating human-centered experiences will be critical to maintaining the emotional and cultural depth of tourism. *Destination management* strategies should adopt hybrid models, ensuring that AI-driven automation enhances rather than replaces human services. This could include AI-powered concierge services in hotels while maintaining dedicated staff for personalized interactions, or AI-assisted guided tours where human guides still play a key role in storytelling and engagement.

Marketing strategies must recognize the contrasting needs of Generation Z travelers: while some seek seamless, tech-enhanced convenience, others prioritize nostalgic, low-tech and experiential travel. Campaigns emphasizing “digital wellness” and “slow travel” can cater to the growing demand for AI-detoxification tourism, while integrating AI-driven recommendation systems to enhance accessibility and trip customization without overwhelming users with technology.

Policymakers play a crucial role in ensuring that AI applications in tourism remain ethical, inclusive and privacy conscious. Regulations should address data security, transparency in AI-driven recommendations and accessibility considerations to prevent generational disparities in travel opportunities. Additionally, tourism educators and industry professionals should launch digital literacy programs that equip travelers with the necessary skills to navigate AI-dominated environments without losing sight of cultural heritage and human connection.

Overall, although framed within a 2070s scenario, our findings are not intended as a precise forecast of distant future tourism. Instead, they illuminate underlying patterns in current Generation Z perceptions, both positive (e.g. enthusiasm for automated mobility) and critical (e.g. AI overreliance, loss of human interaction), that are already emerging in the present. As such, the insights offered here are equally relevant for short- and medium-term tourism planning, where these generational attitudes may soon exert measurable influence.

5.3 Limitations and future research directions

While this study provides valuable insights, some limitations must be acknowledged. The research was conducted among Hungarian university students specializing in tourism, which may limit the generalizability of the results. Future research should conduct cross-cultural comparisons to explore whether these trends and concerns are specific to Hungarian students or represent broader generational patterns across diverse socioeconomic contexts.

Additionally, the study relied on qualitative self-reflective narratives, a method that provides deep, subjective insights but is inherently interpretative. A mixed-methods approach, incorporating quantitative survey data and longitudinal studies, could strengthen the findings and offer a broader perspective on Gen Z's evolving attitudes toward travel. Another limitation concerns the fast-paced nature of AI and Industry 4.0 technologies. As technological advancements accelerate unpredictably, current forecasts may quickly become outdated. Future research should incorporate adaptive methodologies, revisiting these findings periodically to track shifts in technological acceptance, sustainability concerns and intergenerational travel preferences.

Further studies should also investigate how Gen Z's travel expectations evolve across different life stages. Over time, their attitudes toward AI-driven tourism, automation and sustainability will likely evolve. Understanding these shifts will be essential for designing resilient and adaptable tourism strategies that align with future consumer behaviors.

Acknowledgments

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Notes

1. Levels of automation based on the framework created by the Society of Automotive Engineers (2018). SAE 1: driving assistance, SAE2: partial driving automation, SAE3: conditional driving automation, SAE4: high driving automation, SAE5: full driving automation (Miskolczi *et al.*, 2021).

Supplementary material
The supplementary material for this article can be found online.

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