

GENERATION Z AND AI-DRIVEN SHOPPING: COMPARING ONLINE AND IN-STORE CONSUMER EXPERIENCES

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ABSTRACT

This paper examines the methods and intensity of Artificial Intelligence (AI) tool utilization by Generation Z within online and offline shopping environments. The empirical investigation employs a mixed-methods research design, combining a quantitative questionnaire survey (n=114) and six semi-structured interviews conducted in April and May 2026 among respondents aged 18–27 in the Czech Republic. The objective was to identify dominant AI tools, key motivators, and barriers to their adoption, and to evaluate consumers' willingness to share personal data in both environments. Online interaction with AI is more conscious, focusing primarily on generative assistants (ChatGPT), visual search, and recommendation systems. In stores, self-checkout counters and interactive kiosks dominate, though their utilization is often unreflected by consumers. Statistical testing of five hypotheses revealed a higher willingness to share personal data in the online environment ($p = 0.018$). Surprisingly, however, it also demonstrated statistically significantly lower privacy concerns in the offline environment compared to online ($p < 0.001$), which contradicts the assumption derived from the literature. No gender differences in the frequency of AI usage were detected. Based on these findings, a “phygital” strategy was formulated, linking a unified customer data identity, the smartphone as a mediator between environments, and the principles of Explainable AI (XAI).

Keywords: Generation Z; artificial intelligence (AI); online shopping; in-store shopping; phygital retail; mixed-methods research; consumer behavior; privacy paradox

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1 INTRODUCTION

Artificial intelligence is progressively becoming an integral part of everyday consumer shopping behavior. Recommendation algorithms, visual search, conversational agents, and autonomous checkouts are reshaping how individuals shop in both digital and physical environments (Kotler *et al.*, 2021; Knihová, 2024). For Generation Z, having grown up within a fully interconnected digital ecosystem, these tools represent a natural baseline of daily life. However, an open question remains as to whether their utilization is truly conscious, intentional, and comparable across both shopping environments.

Generation Z, defined in this study by the birth years 1999–2008, is characterized in the literature as the first cohort fully socialized within the digital environment and a bibliometric analysis of current research on Gen Z consumer behavior (Halibas *et al.*, 2025) confirms a rapid increase in academic interest in this cohort. Their shopping behavior combines a high level of information literacy, price-conscious ethical consumption, and a demand for authenticity and immediate access to information (Grigoreva *et al.*, 2021; Djafarova & Fouts, 2022). Regarding technological innovations, a strong orientation toward functional utility is evident: AI is adopted when it demonstrably saves time and reduces information overload, rather than for its novelty alone.

Extant literature dedicated to AI adoption in the shopping process exhibits several substantial gaps. Studies typically focus either on e-commerce or, in isolation, on specific technologies within in-store retail, whereas a concurrent comparison of both environments through the lens of a single generational cohort remains scarce. The Technology Acceptance Model (TAM) framework, as proposed by Pavlou (2003), and its extension in the UTAUT2 model (Venkatesh *et al.*, 2012), provide robust theoretical foundations; however, their simultaneous application to online and offline contexts within a single study has not yet been systematically conducted in the Czech environment.

A second significant gap is the insufficient grounding of available studies within the Czech and Central European reality. Foreign research originates predominantly from Western European or Asian contexts, and its transferability to the Czech Generation Z population has not been adequately verified. Concurrently, available data for the Czech market present a paradoxical picture: the Czech Generation Z combines high adoption rates of AI tools with a strong preference for in-store shopping, where they place an unexpectedly high emphasis on experience, thereby creating specific demands on in-store marketing (Klánová, 2025).

The third gap lies in the inadequate empirical verification of the so-called “privacy paradox”—the discrepancy between declared privacy concerns and the actual willingness to share personal data in exchange for personalization (McKee *et al.*, 2024). The literature assumes that Generation Z is more tolerant of online tracking, while the physical presence of technology in in-store shopping may evoke a stronger sense of surveillance. This assumption has not yet been empirically tested in the Czech context.

The primary objective of this paper is to compare the methods and intensity of AI tool utilization by Generation Z during shopping in online environments and in-stores, to identify the motivators and barriers to this utilization—including the willingness to share personal data for personalization purposes—and to formulate recommendations for integrating digital technologies with physical retail spaces. The objective is operationalized into four research questions:

- **(RQ1)** Which specific AI tools does Generation Z actively utilize?
- **(RQ2)** What are the main motivators and barriers to AI adoption in both environments?
- **(RQ3)** How frequently does Generation Z utilize AI tools during shopping, and do gender differences exist?

- **(RQ4)** *To what extent is Generation Z willing to share personal data in exchange for a personalized shopping experience, and what are the differences between the environments?*

The paper is structured as follows: the second section describes the mixed-methods methodology and the statistical testing procedure; the third section presents the main empirical findings, including the results of testing five hypotheses; the concluding section contextualizes the findings within the broader literature, formulates “phygital” recommendations for retail practice, and outlines the limitations of the study.

2 METHODOLOGY AND DATA

The study was conducted using a mixed-methods design that combines a quantitative questionnaire survey with qualitative data collection via semi-structured interviews. The choice of a mixed-methods approach was necessitated by the nature of the formulated hypotheses—which require statistical testing of differences between groups and environments—and the simultaneous need for an in-depth understanding of the mechanisms underlying the statistical data. The target population consists of members of Generation Z residing in the Czech Republic; the definition is based on the birth years 1999–2008, corresponding to an age range of 18–27 years at the time of data collection.

The quantitative survey was administered via a structured online questionnaire using Google Forms. The instrument comprised 21 questions divided into five thematic blocks: sociodemographic data, AI utilization in the online environment, AI experiences in in-store shopping, motivators and barriers, and the willingness to share personal data. Scaled items were measured using a five-point Likert scale (1 = lowest degree of agreement or frequency, 5 = highest). Prior to deployment, the questionnaire was piloted with five respondents from the target group. Data collection took place in April and May 2026.

The sampling strategy combined purposive sampling via distribution within student groups at Mendel University in Brno and the snowball sampling method. The total number of valid responses reached $n = 114$. The sample consisted of 56.1% women and 43.9% men; the age distribution reflected the distribution channel—53.5% of respondents fell into the 21–23 age group, 27.2% into the 18–20 group, and 19.3% into the 24–27 group. In terms of education, university students accounted for 63.2% of the sample.

The qualitative component comprised six semi-structured interviews with respondents aged 20–27, with each of the three age cohorts represented by one male and one female. The interviews were guided by a protocol structured into five thematic blocks (shopping habits, AI in everyday life, AI in online shopping, AI in in-stores shopping, and motivators for future utilization). The average interview duration was approximately 15 minutes. The recordings were transcribed, anonymized using codes R1–R6, and processed using thematic analysis, wherein recurring motifs were synthesized into categories corresponding to the research questions.

The theoretical framework of the research is based on the Technology Acceptance Model (TAM) as presented by Pavlou (2003), which extends Davis’s original formulation by incorporating perceived trust and perceived risk within the e-commerce context. Trust in an e-vendor has long been conceptualized in the literature through three dimensions: competence, benevolence, and integrity (McKnight *et al.*, 2002). An extended framework is further provided by the UTAUT2 model (Venkatesh *et al.*, 2012), which incorporates hedonic motivation, price value, and habit, in addition to performance expectancy and effort expectancy. On this basis, five hypotheses were formulated:

- **H1:** Female members of Generation Z utilize AI tools in the online shopping environment more frequently than male members.
- **H2:** Male members of Generation Z exhibit a higher level of trust in AI tools within the offline environment than female members.
- **H3:** The intensity of AI tool utilization by Generation Z is statistically significantly higher in the online environment than in the offline environment.
- **H4:** Generation Z perceives barriers to AI utilization—particularly privacy concerns—to be more pronounced in the offline environment than in the online environment.
- **H5:** Generation Z's willingness to share personal data for personalization purposes is higher in the online environment than in the offline environment.

Statistical data processing was performed using Statistica software. First, the Shapiro-Wilk test for normality was conducted for all variables. Due to deviations from a normal distribution, non-parametric alternatives were employed instead of the originally planned independent samples and paired t-tests: the Mann-Whitney U test was used for hypotheses concerning independent groups (H1, H2), and the Wilcoxon signed-rank test was utilized for paired comparisons between environments (H3, H4, H5). For the Wilcoxon test, respondents with a zero difference between the two ratings were excluded from the analysis. The level of statistical significance was set at $\alpha = 0.05$.

Ethical considerations of the research were strictly respected in compliance with the standards of the Faculty of Business and Economics at Mendel University in Brno. Participation in the questionnaire survey was voluntary and anonymous; consent to participate was confirmed by submitting the form. Participants in the qualitative component provided informed consent for the recording and processing of the interviews, and the audio recordings were deleted following transcription.

3 RESULTS

This section presents the primary findings from both empirical components of the study. The results are organized according to the shopping environment and conclude with a summary of the testing of the five hypotheses, complemented by additional insights from the interviews.

3.1 AI Tool Utilization in the Online Environment

In the online environment, the conscious utilization of generative assistants and visual tools dominates. The most prevalent AI tool was ChatGPT (or an alternative AI assistant), which was utilized by 63.2% of respondents within the last three months. The second most frequently reported tool was visual search via photography (38.6%), closely followed by recommendation systems such as “similar products” (37.7%). Furthermore, AI-generated review summaries were utilized by 27.2% of respondents, and e-shop chatbots by 16.7%. Augmented reality (AR) and virtual try-on technologies remain on the periphery, with a share of 5.3%. A total of 15.8% of the sample conducted their online shopping without utilizing any AI tools. The distribution of these utilized tools is illustrated in Figure 1.

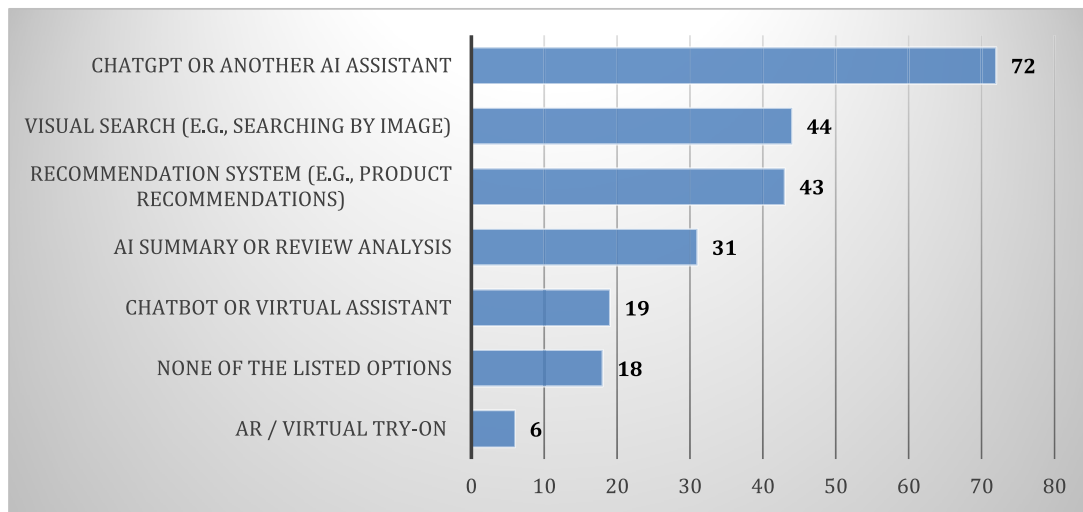


Fig. 1: AI tool utilization in online shopping within the last three months (n = 114)

The mean frequency of AI utilization in online shopping reached $M = 2.54$ ($Mdn = 2.0$; $SD = 1.03$) on a five-point scale, which corresponds to occasional usage. Conversely, the perceived benefit was notably more positive—the mean agreement score with the statement that AI tools facilitate online shopping was $M = 3.41$ ($Mdn = 3.0$; $SD = 1.11$).

3.2 AI Tool Utilization in the Offline Environment

In in-store shopping, experience with AI technologies was paradoxically high, albeit heavily concentrated. Self-checkout counters were utilized by 92.1% of respondents, interactive kiosks or digital screens by 66.7%, and automated loyalty-card discounts by 57.0%. Advanced elements, such as personalized in-store displays or voice assistants, were noted by only a minor fraction of the sample. Merely 3.5% of respondents reported no experience with AI elements within physical stores. The structure of these experiences is summarized in Figure 2.

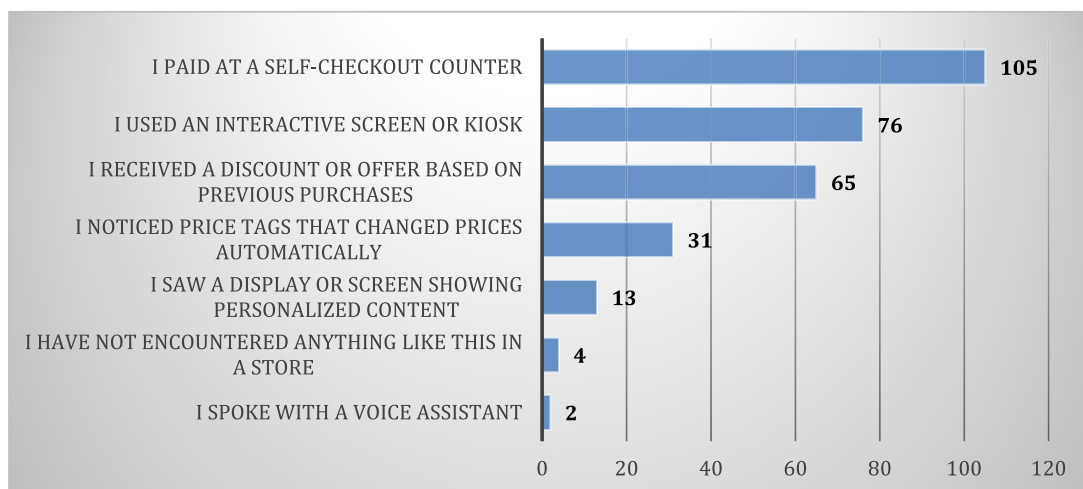


Fig. 2: Respondents' experience with AI elements in in-store shopping (n = 114)

The frequency of conscious AI utilization in the offline environment ($M = 2.37$; $Mdn = 2.0$; $SD = 1.08$) was slightly lower than in the online environment; the perceived benefit was also lower ($M = 2.97$; $Mdn = 3.0$; $SD = 1.10$). This discrepancy likely reflects the fact that numerous offline AI technologies—such as electronic shelf labels (ESLs) or predictive analytics systems—operate in the background, meaning consumers may not register their presence at all.

3.3 Motivators and Barriers to AI Adoption

The primary motivator for utilizing AI during shopping was speed and time savings (66.7%), followed by convenience and comfort (46.5%), personalized recommendations (40.4%), and discounts or promotional offers (38.6%). Hedonic motivation, manifested as curiosity toward new technologies, was cited by only 19.3% of respondents, indicating a highly utilitarian orientation.

On the side of barriers, 35.1% of respondents reported no impediments whatsoever. The most frequently cited barriers were distrust in the accuracy of recommendations (33.3%) and privacy concerns (29.8%). A preference for personal contact with sales staff plays a role for 21.9% of respondents, while technical complexity or a lack of familiarity with the tools deters 16.7% of the sample.

3.4 Hypothesis Testing

The Shapiro-Wilk test demonstrated significant deviations from a normal distribution across all tested variables; consequently, non-parametric alternatives were employed. The summarized results are presented in Table 1.

Tab. 1 Results of hypothesis testing for H1–H5.

Hypothesis	Statistical Test	Key Statistical Values	Result
<i>H1: Females utilize AI online more frequently</i>	Mann-Whitney	$U = 1339.5$; $z = 1.485$; $p = .137$	Not Supported
<i>H2: Males exhibit higher trust in offline AI</i>	Mann-Whitney U	$U = 1598.5$; $z = 0.006$; $p = .995$	Not Supported
<i>H3: AI usage intensity is higher online</i>	Wilcoxon signed-rank	$T = 1121.0$; $z = 1.436$; $p = .151$	Not Supported
<i>H4: Barriers are more pronounced offline</i>	Wilcoxon signed-rank	$T = 84.0$; $z = 3.912$; $p < .001$	Rejected (Inverse)
<i>H5: Willingness to share data is higher online</i>	Wilcoxon signed-rank	$T = 137.5$; $z = 2.365$; $p = .018$	Supported

Out of the five formulated hypotheses, only H5 was statistically supported—Generation Z's willingness to share personal data is statistically significantly higher in the online environment ($M = 2.87$) than in the offline environment ($M = 2.69$). Gender-based differences in the frequency of AI utilization were not confirmed in either the online or offline environments. Conversely, hypothesis H4 was rejected in the inverse direction of what had been originally hypothesized: privacy concerns are statistically highly significantly lower in the offline environment ($M = 2.29$) than in the online environment ($M = 2.53$). This counter-intuitive finding runs contrary to both initial assumptions derived from the literature review and represents the primary empirical contribution of this study.

3.5 Supplementary Insights from Qualitative Interviews

The qualitative analysis revealed several underlying mechanisms that expand upon the quantitative findings. First, the intensity of conscious AI utilization during online shopping is lower than the questionnaire values might suggest; respondents perceive a wide range of interactions with recommendation systems and algorithmic feeds as standard platform features rather than instances of artificial intelligence.

Second, passive acceptance of AI dominates the offline environment; respondents utilize self-checkout counters and loyalty applications without primarily identifying this interaction as an experience with artificial intelligence.

Third, the privacy paradox exhibits a more nuanced structure than captured by the questionnaire; respondents distinguish between preference data in the online environment (perceived as less sensitive) and behavioral or location data collected by loyalty programs in the offline environment. Within this dynamic, the smartphone serves as a critical mediator between both environments, as respondents frequently use it in-store for price comparison, photographing product codes, and retrieving reviews.

4 DISCUSSION

The findings of this study are fundamentally consistent with the framework of Marketing 5.0 advanced by Kotler *et al.* (2021), which defines AI as a technologically mediated yet human-centric tool within the customer journey. The dominance of ChatGPT and visual search in the online environment confirms that Generation Z adopts generative AI as a natural pre-purchase research tool rather than a technological novelty—a trend that aligns with Kingsnorth's (2022) conclusions regarding the integration of AI into the digital shopper journey. Conversely, the low level of conscious AI utilization in the offline environment resonates with the observations of Grewal and Roggeveen (2020), who point out that in-store shopping lags behind digital channels in implementing customer-facing technologies.

The validation of hypothesis H5—indicating a higher willingness to share personal data in the online environment—is consistent with the theoretical framing of the privacy paradox by McKee *et al.* (2024). While Generation Z declares privacy apprehensions, they willingly disclose data in practice in exchange for personalization, discounts, or time savings. The qualitative interviews not only illustrate this paradox but also deconstruct its underlying architecture: respondents clearly differentiate between data types and their respective contexts. Preference data in the online environment (such as purchase history or clothing size) are perceived as substantially less sensitive than the behavioral and location data collected by loyalty programs within in-store shopping.

The most significant empirical contribution of this study, however, resides in the unexpected outcome of hypothesis H4. The assumption derived from the literature review—that the physicality and tangibility of data collection in in-store shopping (consumer movement, loyalty cards, computer vision) would trigger a stronger sense of surveillance than invisible cookie-based tracking—was empirically rejected. On the contrary, privacy concerns are statistically highly significantly lower in the offline environment ($p < .001$). A plausible explanation is provided by the qualitative interviews: Generation Z exhibits heightened awareness regarding the mechanisms of online tracking, which contrasts with their less reflexive perception of in-store technologies, where many AI elements operate subtly in the background. Paradoxically, Generation Z perceives the

online environment as riskier to personal privacy, despite factually disclosing more data within it. This asymmetry underscores Kranzberg's tech thesis, which posits that technology is neither good nor bad, nor is it neutral relative to its social environment (Pitt *et al.*, 2023); within the available literature, particularly in the Czech and Central European context, this phenomenon has not yet been systematically explored.

Furthermore, these results contrast with the assumptions of the UTAUT2 model (Venkatesh *et al.*, 2012) regarding the prominent role of hedonic motivation. In this study, utilitarian motivation—time savings and convenience—overwhelmingly dominates, whereas curiosity and interest in novel technologies were cited by a mere 19.3% of respondents. Consequently, Generation Z perceives AI not as a source of entertainment, but as a functional utility whose value is measured by efficiency rather than novelty. This finding likely relates to the fact that AI no longer represents an innovation for this cohort, but rather a structural standard whose absence would be perceived negatively.

4.1 Practical Recommendations: Phygital Strategies

Three interconnected recommendations for retail practice emerge from the empirical findings. First, the creation of a **unified consumer data identity** that integrates the online user profile with the physical store's loyalty program. The lower privacy concerns documented in the offline environment (H4) provide strategic latitude for a more ambitious data convergence; however, this integration is strictly conditional upon a clearly communicated value proposition (discounts, personalization, or time savings).

Second, utilizing the **smartphone as a mediator**: the mobile application should synchronize the shopping cart in real time, navigate the consumer through the physical store layout, and deliver AI-generated review summaries or product visualizations via QR codes. Informants in the qualitative phase explicitly highlighted virtual try-ons within Augmented Reality (AR) as a key catalyst for future AI adoption.

Third, the implementation of **Explainable AI (XAI)** principles: the primary barrier identified in the online environment was distrust in recommendation accuracy (33.3%). Recommender systems must transparently articulate why a specific product is being displayed to the consumer, thereby eliminating the perception of the algorithm as an opaque "black box" (Knihová, 2024). In this context, trust in AI is not a static state, but a dynamic process cultivated through demonstrable system reliability and transparency (Glikson & Woolley, 2020).

4.2 Limitations and Future Research

This study encounters several methodological limitations that constrain the generalizability of its findings. First, the sample was obtained through a combination of purposive sampling and the snowball sampling method, primarily recruited via student communities at Mendel University in Brno. Consequently, higher education students constitute 63.2% of the sample matrix, meaning its generalizability to the entire population of Generation Z within the Czech Republic remains restricted.

Second, the cross-sectional research design captures consumer behaviors and attitudes specifically during April and May 2026. Given the exponential evolutionary trajectory of artificial intelligence tools, these findings may represent a transient snapshot with limited long-term validity.

Finally, the qualitative phase—consisting of six respondents—is inherently exploratory and does not achieve full thematic saturation.

5 CONCLUSION

This paper has demonstrated that Generation Z utilizes AI tools across both shopping environments with varying degrees of conscious awareness and intentionality. The online sphere is dominated by generative assistants and visual search, whereas self-checkout counters and loyalty applications prevail in in-store shopping, with their utilization often occurring passively. Statistical testing confirmed a higher willingness to share personal data in the online environment and, surprisingly, lower privacy concerns in the offline environment. This finding paves the way for retailers to implement “phygital” strategies grounded in a unified data identity, the smartphone as a mediator, and transparent algorithmic operations. Future research should expand the sample beyond student communities, employ a longitudinal design to track the evolution of consumer attitudes, and conduct a cross-generational comparative analysis.

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