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PREDICTORS OF ARTIFICIAL INTELLIGENCE ACCEPTANCE: FROM ATTITUDES TO BEHAVIOR ACROSS GENERATIONAL GROUPS

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Abstract: The rapid development of artificial intelligence (AI) raises questions about its acceptance across different generational groups, particularly in terms of trust, perceived risks, and actual use. This research, based on the Technology Acceptance Model (TAM), analyzes how generations X, Y, and Z perceive the benefits and risks of AI, contributing to understanding the social implications of AI for ethical and sustainable development. The aim is to identify key predictors of AI acceptance across generational differences. The research was conducted via an online survey distributed via social media from September 1 to 10, 2025, among a convenience sample of 101 respondents from generations X (1965–1980, N=33), Y (1981–1996, N=34), and Z (1997–2012, N=34). The findings indicate the need for tailored educational strategies to increase trust in AI. Future research should examine longitudinal behavioral outcomes and interactions of TAM variables.

Keywords: *AI acceptance, usage behavior, generational cohorts, risk perception, trust, regression modeling, risk perception, Technology Acceptance Model*

Field: Social Sciences

1. INTRODUCTION

The rapid development of artificial intelligence in recent years has expanded the spectrum of its use in all spheres of life, from education, business, healthcare, professional and private sectors, which has raised questions about the patterns of acceptance and use of artificial intelligence in different demographic groups. Current scientific papers and research indicate that younger generations (members of generations Y and Z) are inclined to use and experiment with artificial intelligence, but at the same time they express an ambivalent attitude towards the risks brought by artificial intelligence. The research problem in this paper is therefore formulated as the question: how do attitudes, risk perceptions, and behavior jointly shape the adoption of AI among generations X, Y, and Z? Previous findings suggest that the relationship between usefulness and use is robust, but that it can be mediated by trust and modified by perceived risks and generational identity — for example, greater exposure to synthetic content can increase risk perceptions and lower trust, especially in older cohorts. The aim of the paper is twofold: to identify key predictors of AI adoption (perceived usefulness, trust, perceived risks, knowledge/AI-efficacy) and to examine generational differences in actual use.

2. THEORETICAL FRAMEWORK

2. 1. TECHNOLOGY ACCEPTANCE MODEL AND EXTENSION – RISK-TRUST DIMENSION

The Technology Acceptance Model (TAM) is one of the most commonly used theoretical frameworks in the analysis of how people accept and use technologies in different contexts. Davis (1989) through TAM highlights two key elements in observing the behavior of an individual in accepting and using information technologies, namely the perception of usefulness and the perception of ease of use. The perception of usefulness refers to the belief that the technology will improve the efficiency or quality of task performance for the individual, while the perception of ease of use indicates the extent to which the user expects the technology to be easy to use. In recent years, the TAM model has been expanded with additional variables that include social influence and cognitive processes such as subjective norms, attitudes, trust, risk perception and user empowerment, which further explains the variations related to the perception of usefulness. In the context of modern digital technologies, such as artificial intelligence, TAM has once again proven to be applicable (Venkatesh & Davis, 2000; Ibrahim et al., 2025). Perceived usefulness is confirmed as a predictor of intention and frequency of use, and perceived ease of use is operationalized through digital literacy, but also self-efficacy. Empirical findings confirm that perceived usefulness is the most robust predictor of intention to use technology, while perceived ease of use acts indirectly, amplifying the effect through user satisfaction and motivation, especially in the education sector and

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among academic staff. The application of TAM in AI research shows the complexity of acceptance across generations. Ibrahim et al. (2025) analyzed the acceptance of AI using an extended TAM, with a special emphasis on the role of trust and risk perception. Their results demonstrate that younger generations (members of generations Y and Z) perceive AI to a greater extent as a useful and reliable technology compared to generation X, which is more likely to emphasize risks, such as security issues, information manipulation, and ethical dilemmas. This indicates a clear generational divide in the acceptance of innovative technologies, leading to the need for targeted education to increase trust and reduce perceived risks, especially among older age groups (Ibrahim et al., 2025). Zaremohzzabieh et al. (2025) conclude that family and social contexts shape different motivations and approaches to AI technologies. Younger generations often perceive AI as an aid in everyday tasks, activities, and entertainment. Older generations are skeptical of AI and fear losing control over data and the decisions that AI systems make. Recent scientific works increasingly indicate that trust is a key factor that needs to be integrated into an extended version of the TAM model, especially when it comes to complex and automated systems based on artificial intelligence. Trust then strengthens the acceptance of technology and significantly reduces the perception of risk, as well as reducing ethical dilemmas associated with autonomous decision-making by the system (Gupta & Blanco-Mesa, 2023); Musa et al., 2024). Gupta et al. (2023) points out that TAM models and their extensions continue to dominate research on technology acceptance, but there is a clear need to upgrade the models to better address the specificities of new technologies such as AI, especially with respect to different demographic groups such as generations. Such an approach allows for understanding not only the functional aspects of the technology but also the broader social, psychological, and ethical framework of people's interactions with advanced AI systems (Gupta et al., 2023; Ibrahim et al., 2025). TAM remains key to considering technology acceptance, but in the context of artificial intelligence it should be expanded to include trust, perception, and generational differences in perception and use. Continued research on these dimensions will enable the development of more effective strategies for user education and optimization of the implementation of AI systems in different segments of society.

2.2. GENERATIONAL PERSPECTIVES

Starting from the work of Karl Mannheim (1952), generational divisions represent a conceptual framework for understanding the differences that members of these generations form through common socio-historical experiences. These experiences influence their personal values, attitudes and behaviors within the social cohort. In current research, looking at the generations that dominate the labor market, three generations are often distinguished - Generation X (born between 1965 and 1980), Generation Y (born 1981-1995) and Generation Z (born between 1996 and 2012), but it is emphasized that the boundaries are variable in years. Recent research warns that differences between generations may stem from life cycle or influences rather than generational traits (Schroder, 2023). Considering the concept of artificial intelligence, the degree of media and digital literacy and specific values, understanding the differences according to generations becomes crucial. Their characteristics are significant for the analysis of perception and acceptance of artificial intelligence (Prensky, 2001; Berkup, 2014). Generation X grew up in a time of significant social and political changes, and was also faced with an economic crisis (Jorgensen, 2003). It also witnessed the transition from the analog to the digital age. Generation Y experienced the rapid development of the Internet, social networks and smartphones and is considered the first truly digital generation that integrates technology into all aspects of life (Pew Research Center, 2019). Their early years were marked by a difficult situation on the labor market (Winograd, 2018). Generation Z, known as the iGeneration, grew up in a fully digitized world, marked by the COVID-19 pandemic, climate and political changes, but also the constant availability of information via smartphones (Seemiller & Grace, 2019). Current empirical research shows that the perception of AI differs across generations, with Kozak et al. (2024) showing that age is associated with trust in artificial intelligence, and higher technological competence and use predict higher levels of trust. Younger generations (Y and Z) show more frequent use, while older generations (X) seek transparency and reliability. Mistrust and negative risks towards AI are more pronounced among Generation X than among younger generations. (Diel et al. 2024).

3. HYPOTHESES AND METHODOLOGY

The research instrument was an online survey questionnaire. The questionnaire was distributed via social networks and emails, with clear instructions about anonymity and the purpose of the research. Data were collected during 2025 in the area of northwestern Croatia. The Google Forms tool was used to conduct the survey. The software packages SPSS and Excel were used to process the data. Descriptive statistics methods were applied, HI square test and Cramer's V test. Three hypotheses were set:

H1: Perceived usefulness positively predicts the frequency of AI tool use, with this relationship being stronger when task technology fit is high and weaker or insignificant when it is low.

H2: Higher perceived riskiness of AI negatively affects trust in AI, and perceived transparency (explainability) moderates this relationship by reducing (mitigating) the negative effect of riskiness.

H3: Knowledge about AI positively affects AI acceptance, and technological self-efficacy moderates this effect so that the effect of knowledge is stronger at higher self-efficacy and weaker or insignificant at lower self-efficacy.

The hypotheses were operationalized in a survey instrument with the aim of quantitatively examining the attitudes of individuals.

4. RESULTS AND DISCUSSION

The survey was completed by 101 respondents, of whom it can be seen that 34,7% of respondents were male, while 65,3% were female. When asked which generation they belong to, 32,7% stated Generation X (1965-1980), 33,7% stated Generation Y (1981-1996), while 33,7% stated Generation Z (1997-2012). When asked what their level of education is, 2,0% stated primary school, 16,8% stated high school, 28,7% stated undergraduate studies, 46,5% stated graduate studies, while 5,9% stated postgraduate studies. When asked what their employment status is, 21,8% stated student, 40,6% stated employed - private sector, 25,7% stated employed - public sector, 4,0% stated self-employed, -entrepreneur, 6,9% stated unemployed, while 1,0% stated retired (Table 1).

H1: Perception of usefulness positively predicts the frequency of use of AI tools, with this relationship being stronger when task suitability is high, and weaker or insignificant when task suitability is low. From the answers to the survey question “Do you think that the use of artificial intelligence is useful nowadays?” It is evident that all generations find AI useful. Generation X 87,9%, Generation Y 88,2% Generation Z, 97,1% (Table 2.). So Generation Z sees the greatest benefit from AI. When we look at the graph of results of which industries you think can be improved by using AI, we see that the most votes were received by Manufacturing, Healthcare, Education and Entertainment, while Agronomy, Sales, Military, Legislation and Politics received fewer votes regarding the room for improvement (Figure 1.). Table 2. shows that differences between generations regarding attitudes toward artificial intelligence were examined using the chi-square (χ^2) test of independence. This test was applied because both the independent variable (generation) and dependent variables (attitudes and perceptions related to artificial intelligence) were categorical in nature. Statistical significance was set at $p < 0,05$. The association between generation and self-assessed understanding of artificial intelligence was close to statistical significance and showed a small-to-moderate effect size (Cramér’s V = 0,27), indicating meaningful generational differences in perceived AI knowledge. No statistically significant association was found between generation and general opinion toward artificial intelligence ($p = 0,523$). The effect size was small (Cramér’s V = 0,16), suggesting largely similar attitudes across generations. Perceived usefulness of artificial intelligence did not differ significantly between generations ($p = 0,324$), with a small effect size (Cramér’s V = 0,15), indicating a broadly shared perception of usefulness. Support for the further development of artificial intelligence showed no statistically significant generational differences ($p = 0,540$).

Table 1. Sociodemographic indicators,

		N	%
What is your gender	Male	35	34,7%
	Female	66	65,3%
	Other	0	0,0%
	Total	**101**	**100,0%**
What generation do you belong to	Generation X (1965-1980)	33	32,7%
	Generation Y (1981-1996)	34	33,7%
	Generation Z (1997-2012)	34	33,7%
	Total	**101**	**100,0%**
What is your level of education	Elementary school	2	2,0%
	High school	17	16,8%
	Undergraduate	29	28,7%
	Graduate	47	46,5%
	Postgraduate	6	5,9%
	Total	**101**	**100,0%**
What is your employment status?	Student	22	21,8%
	Employed - private sector	41	40,6%
	Employed - public sector	26	25,7%
	Self-employed - entrepreneur	4	4,0%
	Unemployed	7	6,9%
	Pensioner	1	1,0%
	Total	**101**	**100,0%**

Source: Authors' research

The observed association was weak (Cramér's V = 0,19). A borderline statistically significant association was observed between generation and the belief that artificial intelligence worsens daily life ($p = 0,050$), with a small-to-moderate effect size (Cramér's V = 0,24). A statistically significant association was found between generation and the perception that artificial intelligence can be harmful ($\chi^2 = 10,84$, $p = 0,004$), with a moderate effect size (Cramér's V = 0,33). This indicates meaningful generational differences in risk perception related to AI. Associations between generational groups and categorical variables related to attitudes toward artificial intelligence were examined using the chi-square test of independence. When expected cell frequencies were low, results were interpreted with caution. Effect sizes were assessed using Cramér's V to estimate the strength of associations. Values of 0,10, 0,30, and 0,50 were interpreted as small, medium, and large effects, respectively. Although most generational differences were not statistically significant, effect size analysis revealed small to moderate associations in several dimensions. In particular, perceptions of AI-related risks showed a moderate effect, indicating that generational belonging plays a meaningful role in shaping concerns about the potentially harmful consequences of artificial intelligence. This suggests that differences between generations may be more nuanced than significance testing alone indicates. The thing is that there are already certain solutions that have already been proven in practice from these industries in which further possible improvement has been recognized, on the other hand, when it comes to Politics, Legislation and Military, certain technical solutions encounter ethical and moral obstacles to the use of artificial intelligence. AI already has good results in pattern recognition solutions, which is important in recognizing diseases and weeds in Agronomy, in addition, using multi-criteria algorithms capable of recognizing trends within certain defined models, they are important for meteorological forecasting and disease diagnostics. The mentioned mechanisms are also important for the recognition of individual patterns and diagnostics in medicine, where artificial intelligence is used in diagnostics, reading medical findings, etc. Linguistic models are used in the generation of marketing and sales solutions, as well as in the entertainment industry. So, we can conclude that where artificial intelligence has already shown some progress in performing simpler tasks, that the respondents recognized the usability of the mentioned technology and that they accordingly assumed that further progress is necessary to make the AI algorithms more precise, faster and reliable, thus confirming hypothesis H1.

Table 2. Comparison of understanding, usefulness and use of AI with respect to the observed generations

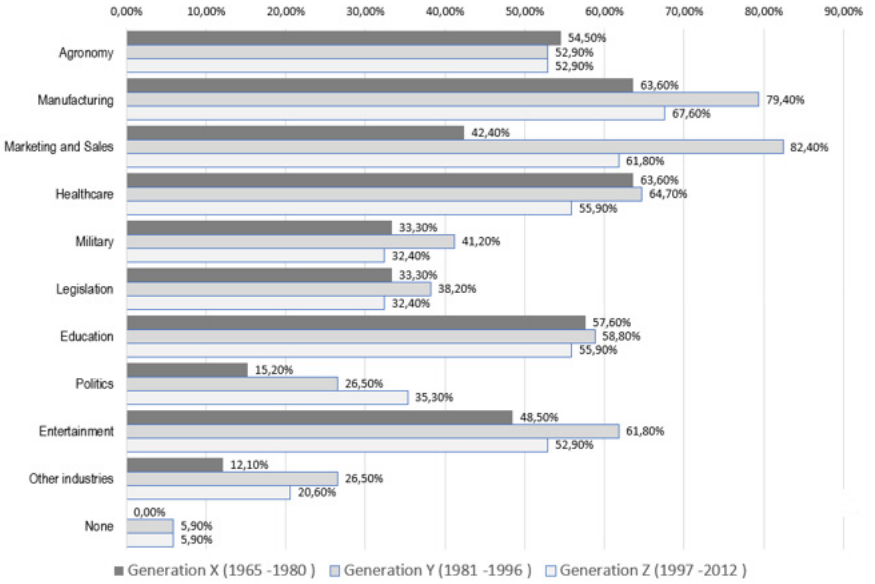
	Generation X (1965-1980)		Generation Y (1981-1996)		Generation Z (1997-2012)		Total		p	X^2	V
	N	%	N	%	N	%	N	%			
How would you describe your understanding of the term artificial intelligence?											
I am familiar with the term, and can describe such technologies in detail	5	15,2%	3	8,8%	10	29,4%	18	17,8%			
I am familiar with the term, and can describe such technologies relatively well	13	39,4%	21	61,8%	18	52,9%	52	51,5%			
I am familiar with the term, but my understanding of such technologies is limited	13	39,4%	9	26,5%	5	14,7%	27	26,7%	0,063	14,80	0,27
I am familiar with the term, but I do not understand such technologies	0	0,0%	1	2,9%	1	2,9%	2	2,0%			
I am not familiar with the term	2	6,1%	0	0,0%	0	0,0%	2	2,0%			
Total	**33**	**100,0%**	**34**	**100,0%**	**34**	**100,0%**	**101**	**100,0%**			
What is your opinion on artificial intelligence?											
Very positive	2	6,1%	2	5,9%	6	17,6%	10	9,9%			
Mostly positive	22	66,7%	18	52,9%	17	50,0%	57	56,4%			
Neutral	7	21,2%	11	32,4%	8	23,5%	26	25,7%	0,523	5,16	0,16
Mostly negative	2	6,1%	3	8,8%	3	8,8%	8	7,9%			
Very negative	0	0,0%	0	0,0%	0	0,0%	0	0,0%			
Total	**33**	**100,0%**	**34**	**100,0%**	**34**	**100,0%**	**101**	**100,0%**			
Do you think the use of artificial intelligence is useful nowadays?											
Yes	29	87,9%	30	88,2%	33	97,1%	92	91,1%			
No	4	12,1%	4	11,8%	1	2,9%	9	8,9%	0,324	2,25	0,15
Total	**33**	**100,0%**	**34**	**100,0%**	**34**	**100,0%**	**101**	**100,0%**			
Do you support or oppose the further development of artificial intelligence technologies?											
Fully support	16	48,5%	11	32,4%	12	35,3%	39	38,6%			
Partially support	13	39,4%	14	41,2%	13	38,2%	40	39,6%			
Neither support nor oppose	3	9,1%	7	20,6%	4	11,8%	14	13,9%			
Partially oppose	1	3,0%	2	5,9%	4	11,8%	7	6,9%	0,540	6,97	0,19
Fully oppose	0	0,0%	0	0,0%	1	2,9%	1	1,0%			
Total	**33**	**100,0%**	**34**	**100,0%**	**34**	**100,0%**	**101**	**100,0%**			
Do you think that using it will worsen or degrade our daily lives?											
Yes	8	24,2%	18	52,9%	15	44,1%	41	40,6%			
No	25	75,8%	16	47,1%	19	55,9%	60	59,4%	0,050	5,98	0,24
Total	**33**	**100,0%**	**34**	**100,0%**	**34**	**100,0%**	**101**	**100,0%**			
Do you agree with the statement: "The application of artificial intelligence can also be harmful"?											
Yes	28	84,8%	34	100,0%	34	100,0%	96	95,0%			
No	5	15,2%	0	0,0%	0	0,0%	5	5,0%	0,004	10,84	0,33
Total	**33**	**100,0%**	**34**	**100,0%**	**34**	**100,0%**	**101**	**100,0%**			

Source: Authors' research

H2: Higher perceived riskiness of AI negatively affects trust in AI, and perceived transparency (explainability) moderates this relationship by reducing (mitigating) the negative effect of riskiness. When answering the question "Do you agree with the statement: "The use of artificial intelligence can also be harmful?" it is evident that respondents are aware of the dangers that AI can cause (Generation Y and Z are 100% sure, (Figure 2.)), but still respondents do not believe that AI will worsen everyday life (Generation X 75,8%, Generation Y 47,1%, Generation Z 55,9%), similarly, from the answers to the survey question "Do you think that the use of artificial intelligence is useful today?" it is evident that all generations consider AI useful. Generation X 87,9%, Generation Y 88,2% Generation Z, 97,1%. This alone confirms the second hypothesis H2.

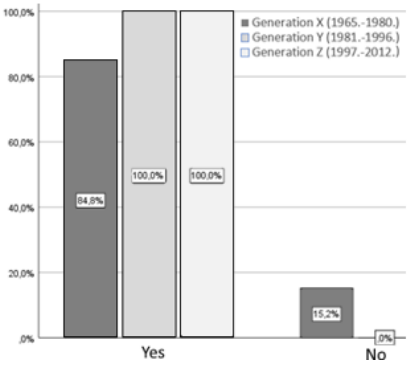
H3: Knowledge about AI positively influences AI acceptance, and technological self-efficacy moderates this effect so that the effect of knowledge is stronger at higher self-efficacy and weaker or insignificant at lower self-efficacy. The answers to the question "How would you describe your understanding of the concept of artificial intelligence?" show how individual generations expressed their understanding of AI. When we compare these results with the answer "What is your opinion about artificial intelligence?"

Figure 1. Which activities do you think could be improved by using AI?



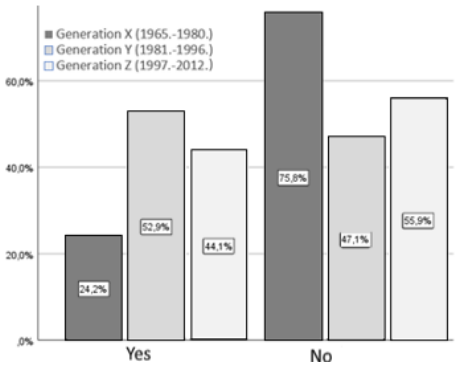
Source: Authors' research

Figure 2. Can the use of AI be harmful?



Source: Authors' research

Figure 3. Do you think that the use of AI will degrade everyday life?



Source: Authors' research

It is clear that where the answers to the first question about understanding AI are positive in relation to the answers to the second question, we prove the H3 hypothesis. Figure 3. shows what respondents think about whether AI will degrade everyday life, we see that generations X and Z think not, while generation Y thinks that it is possible. In general, knowledge and understanding of a particular technology reduces the uncertainty of the behavior of individual systems during operation and exploitation, reduces unexpected outcomes, and thus reduces the predictability of system behavior to the highest possible level.

5. CONCLUSION

This research paper, which included an extended technology acceptance model, provides insight into the predictors of artificial intelligence acceptance among generations X, Y, and Z through the prism of perception, usefulness, risk, and knowledge held by members of the generations, or respondents. While a high perception of usefulness is recorded, respondents also confirm that they are aware of the potential harms brought by artificial intelligence and the risks associated with disinformation. In addition to showing greater knowledge and more frequent use of artificial intelligence tools, respondents from generations Y and Z also show less skepticism compared to generation X. Confirmed hypotheses based on the analysis conducted indicate that perception across all generations is positive in the usefulness of artificial intelligence tools, and perception of risk reduces trust. The theoretical paper contributes to the literature through the application of the extended TAM model, especially in the context of the application of artificial

intelligence, regulatory regulations such as the EU AI Act, which should strengthen trust among users, and through transparency and ethical compliance. At the same time, it can be concluded that targeted education on AI tools is necessary for Generation X, aimed at reducing risk perception and strengthening digital literacy, and for younger generations, at responsible use, especially in the educational and entertainment fields, for which they most often use them. Despite limitations, primarily due to the limited sample, this work and the analysis of the research indicate the importance of generational perspectives and their understanding of AI. Future research should also include longitudinal studies, a larger sample of respondents from different fields, in order to better understand the long-term effects of technological advances on user behavior.

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