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Ready to Grip AI's Potential? Insights from an Exploratory Study on Perceptions of Human-AI Collaboration

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Abstract: *One of the emerging technologies arising with Industry 4.0 is generative artificial intelligence (AI). Despite its disruptive nature and controversies, the effective and ethical use of AI is increasingly preoccupying organizations of all sizes as well as their employees. Focusing on generative AI, this paper presents findings from a qualitative study that provides insights into how Generation Z, the newest workforce, perceives human-AI collaboration. Based on in-depth interviews and a micro-meso-macro approach, the study reveals a dual perspective. Participants recognized the advantages AI brings, such as increased efficiency, productivity, and information availability. However, they were concerned about various risks such as: technology addiction, job loss, data privacy and ethical issues. At the micro level, generative AI was seen as beneficial for providing information and inspiration, but over-reliance could limit people's skills and create dependency. At the meso, organizational level, it could increase efficiency and productivity, but potentially replace jobs. At the macro, societal level, generative AI could support innovation but risks dehumanizing communication and relationships. Data privacy and ethics concerns were expressed at all three levels, indicating that a combination of institutional safeguards and awareness of data privacy and ethics at all levels is required to achieve the full benefits of generative AI. This would help organisations to capitalise on technological advances and support the development of ethical use of AI tools.*

Keywords: *AI; generative AI; Human-AI collaboration; generation Z; Industry 4.0.*

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Introduction

The Fourth Industrial Revolution is currently unfolding and is poised to have profound effects on the way people live and work (Febiandini & Sony, 2023). Technologies like Internet of Things (IoT), big data analytics, and artificial intelligence (AI) are transforming production and business operations globally.

While these technologies empower organizations, including small and medium-sized enterprises (SMEs), to actively engage in Industry 4.0 by creating smart businesses (Calabrese et. al 2023), earlier studies have shown that revolutionary tools and technologies were "under-exploited" by SMEs (Moeuf et al. 2018, 16). According to Moeuf et al. (2018, 16) "Industry 4.0 should be considered a part of a SME strategy", although it also involves various challenges, as SMEs often face financial constraints and staff limitations.

The adoption and exploitation of innovative technologies and innovation based on knowledge-sharing and collaborative generation of knowledge within strategic collaborative networks have a great prominence in the analysis of sustainable development of SMEs (Vătămănescu et al., 2017, 2020, 2022). Recently, many authors have shown a strong correlation between sustainable development, SMEs' ability to innovate and develop attractive products or services (Vătămănescu et al., 2020, 2022) and their activity within collaborative networks that can offer firms a competitive advantage (Andrei & Zaiţ, 2014, 2021; Thorgren et al., 2009; Jarillo, 1988), and enhance organizational learning (Vătămănescu et al., 2016, 2020; Curado et al., 2018) by participating in knowledge-sharing activities (Păduraru et al., 2016; Franco & Haase, 2015). As researchers explain, forming collaborative networks by sharing resources, capabilities and infrastructure with other firms and academic institutions promotes open innovation and technology transfer (Vătămănescu et al., 2022; Moeuf et al., 2018). Industry 4.0 facilitates interconnected, intelligent, and self-optimizing value chains. IoT, cloud computing and blockchain enable collaborative production planning, forecasting and inventory optimization between SMEs, suppliers, and customers (Zhong et al. 2017). This synchronization and transparency across the value chain is beneficial. Leveraging real-time data analytics from IoT devices, AI-based simulations and predictive modeling, SMEs can optimize energy consumption, reduce waste, and make sustainability an integral part of operations and product design (Stock & Seliger, 2016). Therefore, industry 4.0 innovations can help SMEs achieve economic goals alongside environmental sustainability

A prominent technology of Industry 4.0 is AI, which helps large companies, and SMEs as well to automate multiple operations and processes, like identifying market demands, doing market segmentation, personalizing products and services based on each user, developing advertising campaigns, pricing, or forecasting (Chan et. al., 2022). AI-powered sales forecasting is increasingly being incorporated with customer relationship management (CRM) systems to produce tighter sales forecasts to increase productivity and profit margin (Chan et. al., 2022). Concomitantly, AI tools can be used as valuable assistants for most important marketing applications (Chan et. al., 2022). To understand the needs of the market and adapt to competitiveness and innovation efficiently, companies must implement AI as a competitive advantage "imposed" by the market (Gilardini Ricci, 2022).

The recent study of Kanbach et al. (2023) emphasizes the advent of a new, disruptive type of AI technology – generative AI. Although it lacks a universally accepted definition, shortly, generative AI refers to data-driven tools capable of producing "previously unseen synthetic content, in any form" and supporting "any task, through generative modeling" (García-Peñalvo & Vázquez-Ingelmo, 2023). Due to its ability to produce a variety of human-like content (e.g., texts, code, images, audio or videos) (Fui-Hoon Nah et al. 2023, Kanbach et al., 2023; Mondal et al., 2023), and thus to improve workers productivity (Noy & Zhang, 2023), generative AI was rapidly seen as an important business innovation tool by both practitioners and researchers. So, companies will have to adjust and innovate their business models to maintain their relevance and competitiveness when it comes to generative AI (Kanbach et al., 2023), because the great transformation that we are just experiencing undoubtedly proposes new perspectives. Generative AI encompasses all the requisites for widespread commercial success within Industry 4.0 and possesses the potential to serve as a cornerstone of operations for businesses that prioritize technological advancement and innovation (Alhayani et al., 2023). It can provide operational efficiency and reliability by conducting automated processes through rigorous analysis of existing code to identify and rectify potential issues. The integration of generative AI enables engineers and designers to expedite coding with significantly reduced manual effort, substantially enhancing productivity (Upadhyay et. al 2023). Moreover, it plays an instrumental role in the selection of optimal test automation technologies, facilitates the comparison of various tools, and provides guidance on their judicious application within Industry 4.0. (Wankhede & Vinodh, 2023). It significantly enhances language comprehension and processing capabilities,

rendering it an ideal tool for Natural Language Processing (NLP) applications, encompassing functions such as sentiment analysis, text categorization, and language translation. This proves benefits for SMEs seeking a deeper understanding of their customers' needs, and it serves as a powerful resource for academics striving to advance NLP systems (Mijwil et. al 2023).

Generative AI models can automate various tasks from documentation to customer support, freeing up employees for higher-value work. The generative AI and collaborative human-AI networks can enable SMEs to augment human capabilities and harness benefits of Industry 4.0 (Dwivedi et al., 2021). Assessing tasks that can be automated versus those requiring human skills and re-training employees will be crucial. Collaborative human-AI networks allow combining strengths of both and can assist SME employees in creative product design or data-driven decision making (Dwivedi et al., 2021).

In conclusion, Industry 4.0 presents opportunities for SMEs to utilize technologies like generative AI, data analytics and collaborative networks to increase productivity, participate in open innovation ecosystems, and integrate sustainability across operations and the value chain. As literature indicates (Dwivedi et al., 2021), a human-centric approach and re-skilling employees will be key to this transition.

Taking all these above into consideration, for both large companies and SMEs, it seems useful to implement generative AI into their operations, strategies (Mondal et al., 2023), processes, interaction with customers, and their whole activity in general (Kanbach et al., 2023). However, for efficient generative AI usage, we consider that firms need to identify suitable ways this technology could be introduced into their work environment. At the same time, workers need to be trained in order to become skilled AI users and their organization needs to constantly monitor knowledge gaps in the generative AI usage, especially because this technology is just at the very beginning, and it is very likely that not everybody knows how to use it. However, before being trained to use generative AI, employers would need to welcome it into their work environment. Thus, knowing their employees and potential employees' perceptions and opinions about generative AI becomes valuable information for employers.

The future workforce is represented by Generation Z, the cohort that in 2023 already provides the young employees (18 to 26 years old) activating on the labor market. We mention that we considered people born between 1997 – 2012 as Generation Z according to Pew Research Center (Dimock, 2019) age delimitation, although Giray (2022) has shown there are

some variations in the literature. While Pew Research Center (2019) and Dimock (2019) included into Generation Z those born between 1997 – 2012, some other authors proposed slightly different delimitations: 1997 – 2013 (Schroth, 2019), 1995 - 2012 (Barhate & Dirani, 2021), 1995 – 2009 (Dreyer & Stojanová, 2023).

Generation Z - also coined GenZ, GenZers, Centennials, Internet Generation, iGen or Post-Millenials (Giray, 2022) - was described as a generation formed of active learners, individuals characterized as open-minded, pragmatic, thoughtful and multi-tasking people (Giray, 2022). The literature focused on the culture they share indicated that GenZers are technologically literate individuals, who were born in the Internet era, which made them somehow be tech-dependent since they use technology for the majority of activities in their lives (like communicating, acquiring information or sharing knowledge etc.), online materials are conversation starters for them and they are emotionally implicated in their digital experiences and habits (Giray, 2022). Due to these, GenZers are more likely to quickly adapt to new technologies than previous generations (Giray, 2022). Thus, we expect to see GenZers among early adopters of AI tools in the working environment to a higher degree than employees belonging to older generations. So, an in-depth examination of their perspectives, perceptions and feelings about generative AI and AI in general would provide useful information for businesses interested in using AI tools in their work environment.

Although previous research approached this generation's opinions on AI, these studies used quantitative methods (Chan & Hu, 2023; Hameed & Nigam, 2023; Ho et al., 2022; Vinichenko et al., 2021; Vitezić & Perić, 2021) and focused on AI acceptance (Ho et al., 2022; Vitezić & Perić, 2021) or a certain sector, like banking (Hameed & Nigam, 2023) or hospitality (Vitezić & Perić, 2021), without necessarily elaborating on respondents' thoughts, perceptions, or feelings on the topic. Hence, we developed a qualitative study to explore in-depth thoughts, feelings and opinions of generation Z about AI.

Materials and methods

Qualitative research based on in-depth interviews was the method used to explore the perceptions, thoughts, feelings and opinions about AI of Generation Z workers.

The interviews were conducted between April and May 2023 on a sample of 20 participants with following characteristics: GenZers aged between 22 - 26, graduate students enrolled in business master studies,

holding a full-time or part-time job, and having between 6 months - 3 years of work experience, Romanian nationality, 13 females and 7 males. Research participants were recruited from Romanian universities and were guaranteed their confidentiality and anonymity in the study reporting.

In-depth interviews were conducted in a relaxed, discussion-like style and encouraged the use of imagery to stimulate participants to uncover the widest range of meanings and offer detailed descriptions of their perceptions, thoughts, feelings, opinions, and ideas about the investigated topic.

In order to offer a plenary view of research participants' perspectives about generative AI, we drew upon a framework suggested by Dopfer et al. (2004) for evolutionary economics analysis. Evolutionary economics, a paradigm used to explain changes over time in the economic process (Cordes, 2015) is considered a "massively complex structure of rules" and, because of that, "a clear way of seeing the economic system in its natural state" is a micro-meso-macro perspective perspective (Dopfer et al., 2004). In social sciences, the micro-level perspective refers to the individual identity, motives and cognition, the meso one to organizations and groups and the macro one to societies and cultures (Hartmann, 2017). Considering AI as a significant part of the evolutionary economics (since it caused many changes in various economic sectors, processes and practices), we want to explore how GenZers perceive generative AI and a potential collaboration between them and generative AI tools on three levels: micro (i.e., in relation to themselves and their own interests), meso (i.e., how respondents perceive generative AI in relation to their workplace or generative AI's implementation within companies), and macro (i.e., what respondents believe regarding the changes generative AI brings into the world and society at large). Thus, this paper aims to answer the following research questions:

1. *What does GenZ think of generative AI at a micro-level?*
2. *What does GenZ think of generative AI at a meso-level?*
3. *What does GenZ think of generative AI at a macro-level?*

NVivo (version 14.23.0) qualitative data analysis software was used to organize collected data and conduct the content analysis. NVivo is an intensively used software in qualitative research (Kraiwanit et al., 2023; Mațcu, 2022; Ghauri et al., 2021; Gandasari & Dwidienawati, 2020; Mortelmans, 2019; Woods et al., 2016; Azeem et al., 2012; Siccama & Penna, 2008). Drawing upon one of the recommendations offered by Siccama & Penna (2008) to improve credibility and validity in qualitative research, in NVivo, data was first coded with the aid of the auto-code option provided

by the data analysis software. After that, since the automatic coding does not replace the need for a careful read from the researcher (Hoover & Koerber, 2009), we refined the codes proposed by the software. However, the automatic coding indeed allowed us to spend more time looking at the data in different ways (Hoover & Koerber, 2009). Our results are reported below.

Results

Before presenting the themes that emerged in our content analysis, it must be mentioned that in general, our respondents were flexible and variable in their answers. Most interviewees (18 out of 20) did not express an inexorable, one-sided opinion about generative AI, because they had mixed feelings towards this phenomenon. Some said that it was difficult for them to decide when trying to elaborate their opinion on the topic (Respondent no. 3: *I don't know what to choose. Probably, I need to be more in touch with AI to get to the point where I can say yes or no to it, to decide if I am pro or against it*). The others who gave us more settled answers were either making additional comments to highlight both negative and positive aspects of generative AI (Respondent no. 17: *Although AI can be very useful in a wide range of areas, there are also negative aspects associated with its development and use. Data privacy, errors and technology dependence are some of them*) or still expressing a level of uncertainty in their statements (Respondent no. 15: *[…] the uncertainty that comes with the use of AI in our lives. Although it has brought many benefits and has had a positive impact in many aspects of our lives, there are still many things that are unclear about it and can make us feel vulnerable*; Respondent no. 6: *Even if I mostly see this whole process of evolution with joy, because it helps us in certain sectors, I cannot hide the fact that it gives me a sense of unease about our future*). All these suggest that due to its novelty, generative AI seems unpredictable to our respondents, and they could easily change their opinions about it in the future, as some interviewees admitted themselves (Respondent no. 8: *If we're talking about the future, I may change my mind*).

We will now present our results according to the micro-meso-macro perspective.

Human-AI collaboration at a micro-level:

On one hand, respondents saw many benefits in generative AI for themselves, their occupations, interests, and self-enhancement. They believed that AI could help them when lacking creativity (with 6 interviewees mentioning it; e.g. Respondent no. 11: *Working in collaboration with AI, human intelligence is able to create great things, solve problems creatively, generate ideas, develop humanity*) or specific information (with 10 interviewees

saying this; e.g. Respondent 8: *it can help you solve a certain problem, find a certain piece of information*; Respondent no. 9: *it simplifies the search process*; Respondent no. 14: *[…] can get any information they want in a few seconds*). Due to these advantages, 7 out of 20 interviewees considered that generative AI is a good learning tool (Respondent no. 9: *It teaches us new things*; Respondent no. 12: *humans learn from other humans, but also from AIs and vice versa*; Respondent 19: *it knows everything that a man could ever learn*) and an instrument through which human knowledge could be improved (with 5 respondents agreeing on this aspect; e.g. Respondent no. 5: *AI is seen as the way to the future, to advanced knowledge [...] We can obviously talk about advantages for our knowledge; for example, we have access to data, information for free*; Respondent no. 11: *AI implies an infinite accumulation of information, a sea of knowledge*). Beside these knowledge and skill improvement advantages, interviewees (5 of them) also perceived some well-being benefits generative AI can bring (Respondent no. 3: *We can also use it to relax, get rid of stress*; Respondent no. 7: *[...] it makes us feel free of anxiety by taking on our repetitive tasks*; Respondent no. 13: *it brings a feeling of well-being and relaxation*; Respondent no. 14: *I imagine happy people because they seem to be relieved, with solutions to any challenge*; Respondent no. 17: *The purpose of AI is to provide users the information and solutions they need to make their lives easier, which in turn can give them a sense of relief*). Due to all these, 10 out of 20 interviewees explicitly said that AI in general makes people's lives easier and/or better (Respondent no. 1: *it has made our daily lives much easier in some ways*; Respondent no. 4: *it is making our work, or even our entire existence easier*; Respondent no. 20: *future generations will have a better and easier life*).

On the other hand, despite all these facilities, the interviewed subjects somehow felt threatened by generative AI, saying that due to its performance in many fields, its *complex technology [...] with infinite connections* (Respondent no. 4), and the fact that it has *a brain more powerful than the human brain* (Respondent no. 2), AI could *close the horizon of human development* (Respondent no. 16) by limiting human thinking (with 5 respondents agreeing on this; Respondent no. 7: *young people and teenagers are taking shortcuts in the education process, for example by using ChatGPT [...] if they use these tools excessively, it will lead to their thinking being hampered and their performance decreasing. We will find it more difficult to develop our critical thinking, to do reasoning, because we will be more and more immersed in convenience and we will let artificial intelligence take over a lot of our tasks, which is not a bad thing because, as I said, it can help us, but we have to be aware that we also have a mind and a brain, which have to be developed and trained*; Respondent no. 8: *it limits our thinking and makes us act in a robotic, automatic way*; Respondent no. 9: *The sad fact is that many take advantage and use [AI] for the purpose of cheating and not thinking for themselves. I believe that their role is*

to develop us and teach us new things, to simplify the search process, and not to motivate us to slack off and not think). Moreover, with limited thought and relying too much on AI technologies, people could become technology dependent. Here, 6 people admitted that there is a sort of addiction created by AI (Respondent 2: *there is a strong addiction [...] a strong attachment to AI*; Respondent no. 3: *You have to ask the AI for help with anything*; Respondent no. 4: *unconscious dependence [...] instead of choosing to think [...] they will take the information already structured, or directly solved. I am thinking that this could affect people's development*; Respondent no. 7: *my increasing dependence on them limits my thinking and abilities*). However, interviewees believed that these negative aspects could be limited by our own choices and self-control (Respondent no. 2: *whoever wants to "hop on it" goes ahead, whoever doesn't, doesn't. It's up to you how you want AI to impact you*; Respondent no. 7: *If we use these tools in line with the personal or business goals, and if we set some healthy barriers, we will achieve balance between using our own thinking and using AI tools in our daily lives. [...] If used effectively, properly, with some limits, AI can be beneficial, save time, resources, and money*).

Human-AI collaboration at a meso-level

Before elaborating on their opinions about generative AI usage at a meso-level, it must be mentioned that our respondents were aware of the fact that many companies nowadays use AI *in various economic and business processes* (Respondent no. 4), and that *more and more companies are integrating AI to make their business more efficient* (Respondent no. 7).

Moving now to their perspectives on AI, interviewees believed that facilities brought by AI to individuals are and can be transferred to organizations, companies or other institutions as well. Thus, with the help of AI, companies' employees can perform certain tasks and work in general easier (with 5 respondents agreeing on this; e.g. Respondent no. 4: *helps humans to make it easier to perform certain tasks*) and faster (with 5 respondents mentioning this; Respondent no. 17: *tasks that used to take me 4-5 hours I can now do in an hour or even faster*). Through these, employees can become more efficient (with 6 interviewees saying this) and productive (Respondent no. 3: *it will make my life easier and more productive*). Besides offering employees tools to help them work faster and better, respondents thought that AI could also completely take over some of their tasks (Respondent no. 1: *the technological evolution that has led to replacing human labor by machines and computers that, in a faster and especially cheaper way, have been used in different sectors*; Respondent no. 2: *it replaces physical work and turns it into automation executed by a super-performing*

robot/computer; Respondent no. 4: *it facilitates certain activities or processes that can be automated, thus making our work, or even our entire existence, easier*).

As the benefits brought by AI at a micro-level, all these advantages at a meso-level were also perceived by some respondents as a threat. 7 respondents admitted that they believed AI could be taking their jobs in the future (Respondent no. 3: *I've heard that it could take my job. If I were to get a job in the creative pipeline, for example, copywriter [...] I've heard that in the United Kingdom, one guy was told that AI did much better than him. [...] I would feel hopeless knowing that I am no longer useful, that humanity no longer needs me, that I no longer have a purpose in life, and that I can so easily be replaced by a machine*; Respondent no. 5: *AI can also be a danger for us at some point, whether it's the unhealthy habits we develop by constantly using it, or the fact that AI will take over certain activities, areas and we won't be able to recover in time;* Respondent no. 19: *it would lead to the loss of many jobs that are now held by people whom they help to live and, more importantly, be independent*). However, this fear was somehow abolished by those who said that AI tools were developed by humans in order to help them, so they could not replace us since we control them (as highlighted by 5 respondents; e.g. Respondent no. 4: *artificial intelligence, and therefore robots, could never develop if humans were to disappear*; Respondent no. 5: *Humans are behind these technological processes and AI would not exist without the work they do*; Respondent no. 7: *I see them as machines that are like a personal extension and simply help us to make our work more efficient, but no, at the moment, I don't think they could replace us*; Respondent no. 15: *Although artificial intelligence can replace many of the tasks we currently perform, it is important to stress that it will never be able to completely replace us, as there is nothing that compares to human intelligence*; Respondent no. 16: *the power and control that humans have in the development of artificial intelligence*). Moreover, instead of fearing the fact that AI could replace humans in the future, some respondents (8 of them) rather saw an efficient collaboration (cooperation) in the human-AI relationship, with the two elements forming a good team (Respondent no. 4: *Combined, these two elements, i.e. the robot and the human being, form an extremely good team, which manages to do everything much faster, more precisely*; Respondent no. 8: *It can be seen as a loyal friend, who helps you when you need it, gives you the information and puts it at your fingertips whenever you need it, in an easy to follow, structured way*; Respondent no. 12: *We need to see AIs as partners, with whom we will of course have a long-term collaboration [...] I see it as a partner, because it is always available to you, always willing to do something for you as long as it has that information and somehow I see it as a reliable partner*; Respondent no. 16: *While some people fear artificial intelligence and see it as an attack on nature, I see it as an opportunity for collaboration and community building*; Respondent no. 20: *It will become an aid to humans and not a competitor for supremacy*).

Human-AI collaboration at a macro-level

Following the pattern of opinions about generative AI at a micro and meso level, at a macro level, respondents thought AI could be useful and harmful at the same time depending on the purposes it is used for. Hence, on the positive side, it was seen as an efficient tool for the world's innovation (mentioned by 7 respondents; e.g. Respondent no. 15: *AI has facilitated the development of new technologies and innovations that have revolutionized our daily lives [...] This approach has brought numerous innovations and benefits, such as improved healthcare*), development (mentioned by 14 interviewees; e.g. Respondent no. 5: *I think this technology helps us in our development from an informational point of view*; Respondent no. 11: *Working in collaboration with AI, human intelligence is able to create great things, solve problems creatively, generate ideas, develop humanity*; Respondent no. 14: *a very important step for our development*; Respondent no. 16: *can help humanity develop rapidly*), evolution (mentioned by 14 respondents; e.g. Respondent no. 5: *As technology advances, we also evolve as human beings, changing the way we approach different areas of our work and daily lives [...] AI is the central medium for our evolution as humanity in general*), and progress (mentioned by 5 respondents; Respondent no. 15: *[...] a fascinating and complex technology that continues to evolve and surprise us. Although there are some fears and uncertainties, it can bring many benefits, leading to interconnection and significant progress*) due to its applicability and improvements brought in various domains (as 8 respondents highlighted; Respondent no. 9: *It is used in a wide range of fields like education, medicine, art…*; Respondent no. 15: *AI has brought significant benefits in a variety of fields*; Respondent no. 17: *it can improve the quality of people's lives by enhancing health, safety and the environment*).

On the negative side, even if some respondents (3 of them) believed AI kept *us connected* (Respondent no. 2: *it keeps us connected and provides us with various information*; Respondent no. 13: *all this digital connection keeps us together and helps us not to lose old connections*), they also thought it could distance people from each other, by destroying human communication, face to face contact or emotions (with 6 people mentioning such things; e.g. Respondent no. 2: *it distances people, and here I'm thinking mainly of the elderly people who feel powerless in front of these technologies, as their grandchildren's time is taken over by AI and they no longer have quality time to spend together [...] it dehumanizes natural human bonds [...] we will never return to valuing authentic connections, emotions, face-to-face communication, physical shopping, physical interaction between people*; Respondent no. 13: *AI doesn't warm your soul, even though it has all the answers and is always there to help you. Human interaction cannot be replaced*; Respondent no. 14: *Since the world has access to the internet and smartphones, we don't communicate with each other anymore. We*

prefer to stay indoors because there, we are not alone; we have phones and laptops and talk to all sorts of people, but I don't think this is beneficial for us). To elaborate on this, instead of the human connection, it is the human-AI, human-robot connection that seems to strengthen (as 7 respondents highlighted; Respondent no. 5: *AI [...] is the most advanced stage that the human-technology connection is currently at*; Respondent no. 12: *Humans created AI, and some AIs help people and people help AIs, there is a connection and a symbiosis that we should not ignore*). This human-AI connection is not necessarily seen as a negative thing. Even if they were aware of some disadvantages of AI, many respondents (6 of them) believed that if used intelligently, cautiously and with balance, AI can significantly improve our lives, economy, and society at large (Respondent no. 11: *We can use it intelligently, or not. It's all in our hands: when and how we use it*; Respondent no. 15: *it is important to remember that technology and AI are only tools, and our relationship with them must be a balanced and healthy one. We need to be aware of the negative effects of the overuse of technology and try to find a balance between the use of technology and authentic and valuable human interaction [...] It is important that people understand and control this technology to avoid any unintended consequences and to ensure its use for the benefit of society*).

Data privacy and ethical concerns at micro, meso and macro levels

Data privacy and ethical concerns were the biggest concerns expressed by our interviewees at all three levels: micro (i.e., regarding themselves and their own interests), meso (i.e., regarding their workplace or other companies) and macro (i.e., regarding the changes generative AI brings into the world and society at large)..

About data privacy, at a micro level, 6 out of 20 respondents indicated they were feeling some insecurities regarding this topic, without explicitly blaming companies for this (Respondent no. 2: *the unseen, negative intentions behind AI that is so advanced it can collect data and information from all sources: your personal computer, your phone, or databases*; Respondent no. 3: *it takes away our privacy and abusively enters our lives. I'm afraid to think that I'm being controlled, I'm being followed everywhere, and certain people know way too much information about me [...] All my information can be gathered and used for negative purposes*). However, here, respondent no. 2 stated the fact that it is up to people if they accept this or not: *it tracks you everywhere and knows all about you, including bank card data, date of birth, data from documents you have on your computer, your consumer profile data based on tracking bugs and cookies, which you either accept or don't accept in order for it to work/access the sites you enter*. Respondent no. 2 seemed to be supported by respondent no. 6, who also highlighted the fact that *AI extracts information from us, obviously information that we give away (...) we are*

giving it this knowledge. We are the source of information. At a meso-level, 2 respondents expressed concern regarding how companies using generative AI protect their data (Respondent no. 2: *Billions of dollars are made from collecting and selling customer data to various companies. It's data to which these gadgets we use have access*; Respondent no. 19: *our personal data is collected so we can receive personalized recommendations [...] and this can't be a better thing than it is harmful. We are somehow victims of evolution, I would say*). Finally, at a macro-level, 5 interviewees elaborated on negative effects of the all-knowing AI towards the world (Respondent no. 5: *Danger [...] The control that AI can take over humanity, with databases available worldwide*; Respondent no. 15: *if AI is misused or accessed by malicious people, there may be a risk of hacking or other forms of cyber-attack, which can have serious consequences for people and society*).

Regarding other ethical and morality concerns, the interviewees indicated that generative AI could be dangerous for society if used for aspects like *fake news, propaganda* (Respondent no. 2), *manipulation* (Respondent no. 2, Respondent no. 6, Respondent no. 8 and Respondent no. 17) or *surveillance* (Respondent no. 17). To encounter such issues, the solution is seen twofold by our interviewees: (1) there is a need for *laws, policies to regulate artificial intelligence* (which were spotted inexistent by Respondent no. 3), and (2) there is also a need for *an ethical and responsible AI usage. It is important that developers and users consider the impact AI can have on society and take steps to minimize the negative effects and maximize the benefits* (Respondent no. 15). In other words, addressing the ethical dilemmas posed by AI will require action on multiple fronts. While macro-level measures are necessary, the developers and companies deploying AI as well as individual users also bear responsibility. All parties have an ethical obligation to consider the impacts of how AI is built and utilized.

Conclusion and discussion

This study presents the results of an in-depth interview-based exploration of Generation Z's perspectives on generative AI on three levels derived from the evolutionary economics analysis framework proposed by Dopfer et al. (2004): micro, meso and macro level. Our conclusions for these three levels of perceptions regarding AI tend to resemble each other since they all seem to support a very well-known fact about innovations, namely that in general, they bring a lot of controversy with them (Treiblmaier & Gorbunov, 2022). Hence, our respondents perceived both benefits and risks related to generative AI, which aligns with findings previously highlighted by authors like Chan & Hu (2023), Firat (2023), Kanwal et al. (2023) or Mohammad et al. (2023). Thus, even if our

respondents found it to be beneficial in many ways at a micro (for themselves), meso (for companies) and macro (for the society at large) level, most of them (18 out of 20) also perceived some risks or negative aspects related to the use and especially overuse of AI.

Thus, at a micro level, our interviewees thought that even if generative AI could provide them information and ideas when lacking time or inspiration, such facilities could make people rely too much on this technology at some point, this leading to a sort of technology dependence which, on the long-term, would limit human creativity, capabilities, and overall development. This was also highlighted in the study of Kanwal et al. (2023), which explores teachers' perspectives on ChatGPT inclusion into Pakistani higher education. Just like our interviewees, Kanwal et al.'s research participants believed that even if ChatGPT could improve the learning experience through quick access to information, an overreliance on it would limit human critical thinking in the future. However, at the same time, respondents did not deny the fact that AI helped them learn new things and develop new skills, and these benefits could also be transferred to companies (at a meso-level). With the help of generative AI, interviewees thought employers would have better informed and skilled workers, and through these, an increased productivity within their firms. In addition, respondents believed companies could transfer some human-tasks to AI and here, another negative side of AI came to light. Some interviewees expressed a sort of fear regarding the fact that AI could replace them and take their jobs in the future. However, others rather saw a collaboration between AI and humans and not a threat of the former for the latter. This was also supported by Einola & Khoreva (2023) who believe in a coexistence of AI with humans at the workplace rather than in AI taking humans' jobs. At the same time, Dwivedi et al. (2021) state that collaborative human-AI networks allow a combination of strengths for both and can assist SME employees in creative product design or data-driven decision making. This collaboration was not seen possible only within the workplace environment, but also at a macro-level. Our results show that respondents see AI as a tool to improve our society through technological innovation, which would lead to progress and evolution. Nevertheless, they see that AI's use and overuse could break human interactions and contacts. Concomitantly, AI could be used for negative purposes such as spreading fake news, propaganda, and manipulation, as respondents highlighted. It is surprising that our respondents expressed such a view on AI's usage, especially since most studies consulted do the opposite: propose AI for detecting (not spreading) fake news (Akhtar et al., 2023; Mohseni et al., 2021). Nevertheless, the

solution to balance both the positive and negative aspects of AI seem to rely on how we control this technology (i.e. how much information we provide to it and what regulations we apply in the field).

Given the twofold perspective expressed by our respondents within the interviews, this study's results must be interpreted with caution, because almost every positive aspect and/or advantage presented was also put through the lens of some negative implications AI might have and vice-versa. Most of our respondents expressed uncertainty regarding the topic explored in the interviews because they could not be sure how AI would change in the future. Based on that, they indicated that they could easily change their opinions about this technology (Respondent no. 8: *If we're talking about the future, I may change my mind*). Therefore, we strongly encourage future research on the topic, especially because new and surprising findings could appear regarding this theme.

As a strength of this study, the opinion of Generation Z can help SMEs better prepare for Industry 4.0 and adapt to its disruptive technologies, since these young people are gradually becoming employees and entrepreneurs. Generation Z is the first to grow up in a highly digitized world and their opinion brings a fresh and up-to-date perspective on the use of AI. They use digital technology from a young age, they grew up with smartphones, social networks, and voice assistants, and all these offer them a wider perspective on the potential and limits of AI.

The results of the study offer insights with important managerial implications. Given the fact that GenZers (who are the next workforce for employers - Schroth, 2019) consider AI helpful for making tasks easier and faster, companies should not hesitate to implement such tools to increase their productivity. However, AI implementation within business is a complex process, which involves evaluating and understanding a firms' own capabilities and potential regarding AI usage and implementation, training to develop AI-related capabilities and organizational acceptance for these technologies. In this respect, Reim et al. (2020) present an interesting roadmap for AI business model implementation, which might offer valuable insights for SMEs aiming to harness technology advancements, to support the upskilling of their employees, and improve the quality of interaction with AI tools, as indicated in the literature (Cramarenco et al. 2023; Pelau et al. 2021).

Lastly, this paper revealed significant concerns around data privacy and ethics related to generative AI. At the micro level, respondents worried about how much personal data AI systems collect and how it could be used negatively. At the meso level, they were concerned about how companies

protect and utilize user data. At the macro level, they feared the societal impacts of AI being leveraged to spread misinformation, enable surveillance, and manipulate people. To address these issues, interviewees pointed to the need for both regulation and responsible development and AI usage. Rules and policies are needed to curb dangers like propaganda and hacking. However, individual developers and users also have a moral responsibility to consider the impacts of AI and use it in an ethical way.

In conclusion, fully realizing the benefits of generative AI while minimizing harm will require a combination of institutional safeguards and conscientiousness around data privacy and ethics at all levels. This will help companies to harness technology advancements and support the upskilling of their employees and their interaction with AI tools.

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