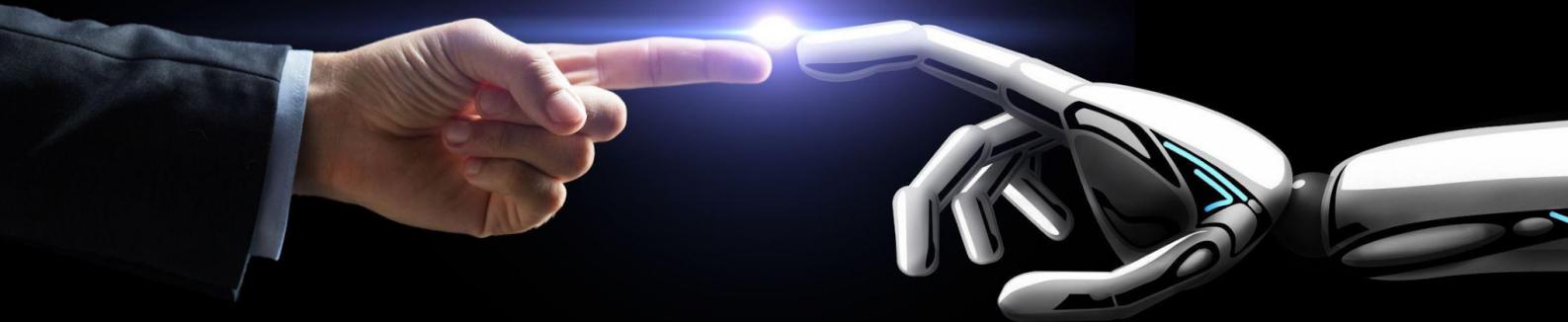


Talk to the AI: The Next Frontier in Work Performance: A Case Study.

Investigating the Impact of Conversational Generative AI on Creative Process



MSc Business Information Management

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Abstract

This master's thesis investigates the potential of conversational Generative Artificial Intelligence (cGAI) on the creative process. Centring on the widely adopted large language model, chatGPT, the study establishes a conceptual framework derived from the CPS and Geneplore model (Finke et al., 1996; Osborn, 1963), enclosing the main constructs of the creative process scrutinised in a cGAI-enhanced environment. The study posits three primary areas where cGAI can significantly impact creativity: (1) *divergent thinking*, (2) *context awareness*, and (3) *real-time support and feedback*. The qualitative research design includes expert interviews from diverse professional and academic backgrounds, offering comprehensive insights into the implementation and perception of cGAI in creative tasks. Two cases, scholarly domain (SD) and economic sector (ES), have been established to assess findings through cross-examination. Key findings suggest that cGAI can significantly enhance *divergent thinking* by promoting randomness, generating novel ideas, and verifying information. It was also recognised for improving *context awareness* through task automation and as an intellectual facilitator. For *real-time support and feedback*, while cGAI was perceived as having high proficiency in promoting efficiency and continuous learning, concerns were raised about uncritical affirmations and the potential for incorrect information. The study highlights the importance of effective human-AI collaboration for optimising these benefits and the need for further advancements in AI systems to overcome identified limitations.

Keywords: Artificial Intelligence (AI); Creativity; Human-Computer Interaction; Natural Language Processing (NLP); Machine Learning; Workplace Efficiency; Cognitive Augmentation

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Executive Summary

The presented Master's thesis titled "Talk to the AI: The Next Frontier in Work Performance: A Case Study. Investigating the Impact of Conversational Generative AI on Creative Process" explores the transformative influence of cGAI, specifically the commonly utilised large language model known as chatGPT, on the creative process. The research emerges from the foundation provided by the Creative Problem Solving (CPS) and Geneplore models (Finke et al., 1996; Osborn, 1963). By linking these foundational theories to the modern applications of AI in creativity, a new conceptual model is constructed and subsequently updated, reflecting the integration and enhancement of the creative process within a cGAI use case environment.

This research categorizes the impact of cGAI on creativity into three significant domains: *(1) divergent thinking*, *(2) context awareness*, and *(3) real-time support and feedback*. The relevance of these dimensions stems from their ability to shape the trajectory of creative thought and output when intertwined with AI tools (Corazza, 2017; Finke et al., 1996; Osborn, 1963; Sielis et al., 2009). To study the practical applications and provide empirical evidence for this theoretical model, the thesis uses a qualitative research methodology, drawing from a diverse spectrum of expert opinions via interviews across both academia and industry.

Two distinct sectors serve as case studies for this research - the scholarly domain (SD) and the economic sector (ES). This dual approach, drawing insights from both the scholarly and economic realms, offers a unique depth of understanding. It allows the study to compare different professional perspectives on cGAI and assess its multifaceted impact on creativity. The comparative findings offer a comprehensive view of the perception and use of cGAI, enhancing the credibility of the study.

The SD case draws perceptions from five participants from different academic backgrounds. The participants include a philosophy researcher, an AI developer, a social impact researcher, a professional actor, and an education innovator. This multidisciplinary lens allows for a richer dialogue on the role and impact of cGAI in diverse fields. Participants noted high agreement levels on cGAI's ability to facilitate brainstorming, idea generation, and text generation. However, its capabilities in original solutions, interdisciplinary thinking, and pattern recognition were received with mixed responses. Additionally, while participants appreciated cGAI's potential to enhance context awareness and improve efficiency, reservations were expressed about its ability to mimic human interaction, initiate actions, maintain accuracy, avoid bias, and demonstrate empathy.

The ES case delivered perspectives from five participants from different professional backgrounds, and these include: developer, IT service expert, design director, data scientist, and innovation strategist. This diverse group allowed for a comprehensive dialogue on the potential of cGAI within the technology-intensive industry. Participants agreed on cGAI's ability to facilitate divergent thinking, with particular emphasis on its ability to aid brainstorming, enhance ideation, and foster cross-disciplinary knowledge synthesis. In terms of context awareness, cGAI was recognized for enhancing task automation and workflow organization, although

some participants voiced concerns about its contextual understanding and risk of misinterpretation. Regarding real-time support and feedback, cGAI was appreciated for its efficiency and reduced response times. However, reservations were expressed about its ability to mimic human interaction, handle incorrect information, and display empathy, indicating areas that require further improvements.

Overall, the cases provide a nuanced understanding of cGAI's role in creative problem-solving, recognising its potential while also highlighting areas for improvement and therefore further developing the initially constructed conceptual framework through additional sub-propositions.

Building on the body of knowledge on creativity and GAI, the study also offers specific, cross-disciplinary managerial recommendations. These include: 1. Effective cGAI Integration: It is crucial for management to stay updated with the latest cGAI tools. Skill in 'prompting' is key for optimal cGAI utilization, which can significantly boost efficiency and innovation across enterprise departments. 2. AI Model Selection: Managers should carefully choose between *generative* models like chatGPT and *extractive* models, depending on task needs, due to their different strengths and limitations. 3. Balanced Human-AI Collaboration: While cGAI offers considerable benefits, it shouldn't replace human creativity. Managers should ensure an environment where human creativity and AI complement each other, instead of one replacing the other. 4. Promoting Innovation and Adaptability: With AI adoption continually evolving, managers need to ensure their organisations' readiness to adapt and innovate, encouraging an organisational culture receptive to change.

The study further delves into a comparative analysis of the Scholarly Domain (SD) and Economic Sector (ES) cases, underlining the importance of cross-case examination in multi-case research. The findings suggest that while both the SD and ES utilize cGAI, their motivations and the extent of its implementation differ significantly due to their unique work environments.

Identified limitations of mentioned cGAI systems, such as their tendency for uncritical affirmations and potential to circulate misinformation, signify the areas requiring further refinement in future AI developments. These drawbacks, while providing an honest and constructive critique of current AI capabilities, also guide future advancements in AI technology.

In conclusion, the Master's thesis serves to bridge the gap between theory and practice in the exploration of cGAI's influence on creativity. These findings and insights can guide individuals and businesses on how to harness AI's full potential to enhance creativity and innovation in their respective fields.

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List of Abbreviations

| | |
|----------------|---|
| AI | Artificial Intelligence |
| cGAI | Conversational Generative Artificial Intelligence |
| chatGPT | Chat Generative Pre-training Transformer |
| CNN | Convolutional Neural Network |
| CPS | Creative Problem Solving |
| ES | Economic Sector |
| GAI | Generative Artificial Intelligence |
| GAN | Generative Adversarial Network |
| NFT | Non-Fungible Token |
| NLP | Natural Language Processing |
| SD | Scholarly Domain |
| SDG | Sustainable Development Goals |

1. Introduction – A new era of AI-enhanced Work

In recent years, conversational Generative Artificial Intelligence (cGAI) has emerged as a powerful force shaping the future of work, particularly in creative performance (Bernard, 2023). Generative AI large language models, such as GPT-3, have advanced rapidly, offering organisations the potential to develop immaterial workers capable of performing repetitive tasks and complex operations across various sectors, including banking, media, and medicine (Chui et al., 2022; Davenport & Mittal, 2022; Pavlik, 2023). This case study explores the potential of cGAI as an assistant that enhances the creative process (Davidson & Sternberg, 2003; Lubart & Mouchiroud, 2003).

The research contributes to ongoing discourse by examining how facets of the creative process can be significantly augmented through conversation with generative AI language models. Specifically, the addressed gaps are, on one side, philosophy of mind and cognitive science, with a particular focus on the theory of creativity and the other side, computer science and AI research. Creativity, characterised by the ability to generate original and worthwhile ideas, has long been considered a uniquely human attribute (Baas et al., 2015; Davenport & Mittal, 2022; Haponik, 2023; Hughes et al., 2021). However, cGAI has opened new avenues for creative problem-solving and idea generation, revolutionising how we approach creative tasks (Mazzone, 2019; Moruzzi, 2020).

This study focuses on investigating the application of generative AI technologies in three key components of the creative process: *(1) divergent thinking*, *(2) context awareness*, and *(3) real-time support and feedback*. These elements have been directly associated with a high degree of creative endeavour (Amer, 2023; Mazzone, 2019; Moruzzi, 2020; Sielis et al., 2009). Recognising how the human workforce can leverage these technologies to enhance skilled labour is paramount. The forthcoming generation of digital AI tools, including chatGPT 4 and related conversational language models, will cause significant shifts within the labour market, heightening organisations' demand for more advanced skill sets (Berwick & Smith, 2022; Chui et al., 2022; Hughes et al., 2021). This research seeks to elucidate the potential of such technology in the domain of creativity, offering valuable insights into the potential of these tools to augment human creativity.

To this end, a comparative case study examines and contrasts the perceptions of the two distinct sectors (cases), namely the scholarly domain, encompassing the realm of researchers and scientific investigators, and the economic sector, representing the business and commercial professional domain. The proposed comparative analysis identifies similarities and differences between the sectors' perceptions of the technology, enhancing the study's validity and generalisability, besides offering new insights into the technology's perception in the creative context (Eisenhardt, 1989).

1.1. The Novelty in this Case Study

This case study employs a unique approach by examining the potential of cGAI to augment critical facets of creativity, which are increasingly essential for problem-solving (Lubart & Mouchiroud, 2003). As the pioneering investigation into cGAI's role in (1) *divergent thinking*, (2) *contextual awareness*, and (3) *real-time support and feedback*, this study offers significant insight into the enhancement of human creative capacity using cGAI and subsequent improvement of problem-solving abilities. This case study represents a pioneering effort to recognise elements (1), (2), and (3) as integral components of creativity. This study delivers an initial framework, adapted from the CPS and Geneplore model (Finke et al., 1996; Osborn, 1963), encapsulating the main constructs of the creative process scrutinised in a cGAI-enhanced environment. Besides, this case study fits in the current literature about creativity and cGAI by delivering empirical perceptions of experts in the related field of studies (Scholarly Domain Case) and industries (Economic Sector Case) on utilitarian aspects of AI models, from aiding strategic thinking to impacting creative practices (design, problem-solving) and influencing the future of work, as denoted by the vast body of literature by Guo et al. (2023), Gruetzemacher (2022), and Hughes et al. (2021). Lastly, in drawing attention to the dearth of comprehensive literature on the impact of cGAI on business and research procedures, the study by Kasneci et al. (2023) emphasizes the critical necessity for such scholarly explorations. The present research addresses this gap, thereby contributing to the ongoing conversation and offering fruitful avenues for future research in the domain of AI and creativity.

It employs them as an aggregated framework to attempt capturing the enhancement of creative processes facilitated by cGAI. The examination of cGAI's effectiveness in the creative process contributes to a comprehensive understanding of the potential for this technology to fortify human inventiveness, thereby promoting innovation and advancement throughout a wide range of industries. The given thesis has achieved this by constructing a conceptual model from more widely recognised models for creativity measurements like the CPS and Geneplore model, which mainly predicted the propositions on each creative element (1), (2), (3), and extended it by providing sub-aspects that define and moderate each element respectively (Finke et al., 1996; Osborn, 1963). Specifically, the initial conceptual model solely focused on the three mediating elements that constitute an enhanced creative process throughout different tasks demanding innovative/creative input, as shown in Figures 1 and 3. The updated model offered a more extensive explanation of elements that enhance the creative process, as it is explained below.

Firstly, the conceptual framework now includes the "Information Verification" theme, an under-discussed facet in *divergent thinking* literature. This theme relates to the capacity of cGAI to use its extensive knowledge base to verify and cross-check information, thereby improving the quality of the creative process. Secondly, the theme of "Randomness" is now explicitly recognised in the model, acknowledging the role of randomness in sparking creativity and enhancing *divergent thinking*. However, it is traditionally less emphasised in the literature. The capacity of cGAI to generate random or 'nonsense' ideas has been identified as a

valuable asset, providing the potential for unexpected connections and innovative thought. Lastly, the theme of "Novel Ideas" has been added to the model, reflecting the overarching goal of *divergent thinking*. The innovative contribution of cGAI in this area, specifically its ability to synthesise novel ideas by combining elements from its broad knowledge base, is a key focus point. Participants noted that the generative function of cGAI should not be considered a source for completely novel ideas due to the inherent limitations of a pre-trained language model. The inclusion of this theme in the conceptual framework aims to depict the nuances of cGAI's role in the generation of novel ideas and its influence on the creative process.

For (2) *context awareness*, two newly identified themes that have not been traditionally associated with the literature on *context awareness* were found: "Task Automation" and "Intellectual Facilitator." The first one implies that due to the cGAI's automated repetitive elements of a task, the focus is enhanced on the broader problem at hand, ultimately improving *context awareness*. By removing routine processes of a task, such automation enables users to increasingly dedicate attention and cognitive focus to understanding and interpreting the overall context. "Intellectual Facilitator" refers to the potential of cGAI to provide more broad perspectives on complex situations by synthesising diverse viewpoints and navigating the complexity of situations, increasing the user's understanding of the context.

Finally, "Language Versatility" and "Empathic Communication" add depth to the understanding of (3) *real-time support and feedback* enhancement potential. Firstly, the "Language Versatility" implies that such cGAI systems function across various human languages, broadening their reach and universality. Findings, therefore, emphasise the importance of multilingual capabilities in cGAI design and development to ensure these systems can be accessible and applicable to the widest array of users. Secondly, the updated conceptual model integrated "Empathic Communication", which underscores the necessity for AI systems to exhibit emotional intelligence, thus fostering an increased interpretable intimacy. Facilitated human-like interactions in AI systems make them widely adopted, and models that can successfully interpret and respond to human emotions effectively stimulate future technological advancements in this direction. The thesis resonates with Gruetzmacher's (2022) and Guo et al. (2023) studies for *real-time support and feedback*. Gruetzmacher suggests that generative AI language models can assist in organisations' strategic thinking and planning exercises, providing real-time support. Guo et al. explored the differences and similarities between chatGPT and human communication styles related to language versatility.

With these newfound sub-themes, the revised conceptual framework depicted in Figure 14 now provides a more comprehensive understanding of the different factors that enhance the creative process, specifically focusing on the role of cGAI.

1.2. The Practical Implications:

This research endeavours to illuminate the potential for businesses and society to harness cGAI in augmenting the creative process, an aspect regarded as "not replaceable" by artificial intelligence due to the

complexity of human creativity (Davenport & Mittal, 2022; Haponik, 2023). As Corazza (2017) explains, placing human creativity at the core of the digital transition is essential, given the increasing significance of this skill in this era of necessary human-machine collaboration. Since creativity entails generating novel ideas and unconventional thinking, it presents a formidable challenge for machines inherently limited by pre-established, human-enforced, limited datasets. Furthermore, creativity has traditionally been the main driver for innovation and growth, often regarded as the "seed of all innovation", given its critical role in advancing organisational development and evolution (Amabile et al., 1996). Thus, this study seeks to elucidate the industrial and educational sectors' perception of cGAI's capacity to enhance human creativity. Accurately capturing these perspectives from professionals and experts in the field is crucial for clarifying the genuine impact of this technology amidst the prevailing hype surrounding artificial intelligence and the uncertainty regarding its effects on the human labour force (Baruffati, 2023; Desk, 2023; Zarifhonarvar, 2023). Finally, it can deliver valuable insights into how organisations can use this technology to bolster creativity and innovation in their workforce.

1.2.1. Research Objective and Research Question

This investigation aims to enhance employees' engagement with cGAI and foster their creative abilities, ultimately leading to heightened productivity and problem-solving skills by providing empirical data on current use-cases in tasks that involve creative reasoning. In the long term, this will allow further dedication to the ethical and sustainability goals outlined in the European Community's Agenda 2030 (Sustainable Development Goals, 2023). Notably, it addresses SDG 4, "Quality Education", by intending to bolster employees' engagement and creative skills through cGAI, potentially increasing the number of individuals equipped with relevant skills for a technologically evolving employment landscape. It also addresses the intentions of SDG 8 "Decent Work and Economic Growth", and 9 "Industry, Innovation and Infrastructure", aiming to stimulate economic growth and promote industry innovation by potentially amplifying productivity and problem-solving capabilities through cGAI. Additionally, considering the nature of the data analysis design for this research, rigorous attention was dedicated to the management of sensitive interviewee data, pursuing transcription, data cleaning and analysis entirely offline, ensuring the utmost protection and confidentiality of the information. This approach was carefully devised to conform to the stipulations of the General Data Protection Regulation (GDPR) guidelines, thereby underscoring the commitment to maintaining data privacy and security in all stages of the research process.

Finally, this thesis aims to contribute to the extant literature on cGAI and its associated domains, including Convolutional Neural Networks (CNNs) and Natural Language Processing (NLP), particularly emphasising their capacity to augment creative output.

This case study employs a qualitative analysis, utilising semi-structured interviews to discern salient themes and perceptions among practitioners and academics, clarifying connections with existing literature

and identify insights that show direction towards the related propositions using a deductive approach. The research question guiding this investigation is:

RQ: How does interacting with Generative Artificial Intelligence influence the creative process within the professional context?

2. Literature Review

Human interaction with machines always involves a learning curve. For example, people born in the early 20th century were used to snail mail and could not easily switch to electronic mail systems such as Hotmail, AOL, or Yahoo Mail. It involved a steep learning curve that many needed help to follow (Rogers, 1962). Similarly, more cutting-edge technology, such as Deep Learning algorithms and their application in training neural networks, are often only utilised regularly by a minority with the right know-how to gather the most value (IBM, 2023).

However, technology enormously improved in the past decade, facilitating communication between humans and cutting-edge AI: NLP (Bahja, 2020). Consequently, it creates a more sophisticated and natural interaction between the large group of the inexperienced in AI and complex technology. Consider the Google search algorithm as an example (Graham, 2019). Previously, a comprehensive understanding of the algorithm was binding to retrieve the desired information efficiently. Advancements in NLP have considerably enhanced the user experience by making conducting a Google search more intuitive and in line with human communication patterns (Graham, 2019). The algorithm can now comprehend human input and provide relevant information from its extensive data repositories (Graham, 2019). However, the most exciting application of NLP in recent times is in the field of Generative AI (GAI), which experts interpret as a new milestone for human interaction with AI (Miyato et al., 2016). This case study elucidates the practical application of generative AI and NLP in diverse professional contexts. The study aims to bridge the gap between the theoretical understanding of these technologies and their real-world implementations.

The recent popularity of chatGPT has aroused enormous interest in technologies around NLP and neural networks and attracted investments from major tech companies such as Amazon Web Services, Microsoft, and more (OpenAI, 2023). Interestingly, as Microsoft acquired the developers of chatGPT, Open AI, media now report that the tech company will turn it into a professional business opportunity (Metz & Weise, 2023). The latest advances in this technology represent a big step toward general artificial intelligence and human-level generalisation, which are the ultimate objectives of numerous AI investigators, including those at OpenAI and Google's DeepMind. Moreover, such systems bring huge disruptive potential to the world, as they might drive accelerated economic growth and fundamentally change industry and society (Gruetzmacher, 2022). This study aims to contribute to the literature by Gruetzmacher (2022) and Metz & Weise (2023) by offering insights into the practical applications of AI, particularly cGAI, in creative problem-

solving across various industries and academic domains. Insights gathered in this study will not only help clarify the current debate on the potential of AI in industry and society but also shed light on the extent to which AI-driven tools like chatGPT are moving toward human-level generalisation. Furthermore, the findings from this study will inform future research and development efforts in AI, ensuring that the technology is designed and implemented in ways that maximise its true capabilities of creative process enhancement.

2.1.1. History of Natural Language Processing

Generative Artificial Intelligence (AI) is a complex technology requiring extensive expertise and knowledge. Nevertheless, the advent of advanced NLP technology in recent years has revolutionised the accessibility and usability of Generative AI for anyone seeking to improve their work processes through digital technologies (Torfi, 2020). Furthermore, incorporating NLP technology enabled users to interact with the complex General Adversarial Networks (GANs), the primary technology behind cGAI (Goodfellow et al., 2014; Hughes et al., 2021). This significant development has made it possible for individuals with little to no technical expertise to benefit from the advantages of Generative AI technology (Baruffati, 2023). This research aims at verifying how such a leap in human-level interaction with Generative Artificial Intelligence (GAI) can improve the creative process of a professional independent of its field.

With the advent of the internet and the exponentially rising amount of text data available, NLP gained considerable attention in the 1990s and 2000s from its beginning in the 1950s, as claimed by Bahja, M. (2021). Techniques such as deep learning were a vital leap forward to the more complex ML-based models because of their quicker adaption and learning capabilities. Overall, they required less effort to design and evaluate. In addition, with faster computation availability, NLP models could be trained on large datasets and achieve higher accuracy (Jones, 1994). In recent years, NLP has made impressive advances and has become a key technology in many applications, such as sentiment analysis, text classification, and chatbots (Bhoir et al., 2022). However, the development of vast language models, such as GPT-3 by OpenAI, only recently paved the way for a large variety of new opportunities and applications in fields like journalism, medicine, and finance (Bavarian et al., 2022; Ramesh et al., 2022; Miyato et al., 2016).

In conclusion, the evolution of NLP has progressed from rudimentary rule-based systems to highly sophisticated models capable of comprehending and responding to human input with unprecedented efficacy (Bavarian et al., 2022; Ramesh et al., 2022; Miyato et al., 2016). This progression in NLP is the foundation for recent advancements in cGAI. Experts contend that these developments constitute a significant milestone in a machine's ability to understand and fulfil human requests (Wang et al., 2023). This case study aims to provide evidence-based insights into the current state of cGAI, contributing to the existing body of literature that chronicles the ongoing improvements in NLP and cGAI technologies.

2.1.2. Where NLP meets cGAI

The previous section provided an overview of the history of NLP, the technology that allows humans to interact with the most advanced GANs today. This section will focus more on GAI and briefly explain the core of cGAI, Generative Adversarial Networks. Its structure is crucial for explaining how it relates to the creative process in the later sections.

For managers and stakeholders to fully grasp the potential of conversing and interacting with an AI, it is crucial to understand how language models work. Being able to precisely write the prompt that the agent will feed to a cGAI, such as chatGPT, will inevitably affect the quality of the generated output (Amer, 2023). AI models do not have human-like reasoning patterns; therefore, sending in a brief and easy-to-understand request will ensure that the AI will investigate the data the agent is more willing to know about. This process, however, is increasingly simplified by advancements in NLP. This understanding is crucial for prospective participants with limited familiarity with cGAI functionality. Securing an exhaustive understanding of well-designed prompts' potential is vital for fostering the creative process, as these prompts effectively harness the complete capabilities of cGAI (Amer, 2023). In addition, such insights, presented for study participants with low familiarity with cGAI, will help them provide informed input on their perspective on cGAI.

Integrating NLP with GAI presents a unique opportunity for computational systems to understand and respond to human input more naturally. The ability of NLP-powered cGAI systems to process vast amounts of data and generate accurate responses is critical in enhancing the performance and efficiency of tasks involving creative thought. To better understand this concept, the following sections briefly explain the workings of cGAI systems and provide reasoning for enhancing performance in creative tasks.

According to the present research, generative models are algorithms created to evaluate and comprehend data from a training set (Goodfellow et al., 2014; Moruzzi, 2020). The potential behind this is that these models can forecast the related attributes and produce new data comparable to the training set. GANs' exploration becomes even more necessary since, by their very nature, they are different from all other generative algorithms. In GANs, two neural networks are denoted as "generator" and "discriminator". The generator is responsible for creating new data instances, while the discriminator assesses the authenticity of the newly generated data. Both generator and discriminator compete with one another, as Goodfellow (2014) refers to as a "cat and mouse game", hence the name "adversarial" (Goodfellow et al., 2014; Moruzzi, 2020).

The human creative process often necessitates a delicate equilibrium between "divergent" and "convergent" thinking. In this context, *divergent thinking* refers to generating numerous unique ideas and exploring multiple possibilities and alternatives. Conversely, convergent thinking involves refining, assessing, and selecting the most promising ideas from the generated pool (Goldschmidt, 2016). The complex interplay of emotional, cognitive, and cultural factors influencing human creativity is not entirely captured within the GAN framework. Nonetheless, GANs mimic certain aspects of human creativity, such as the continuous refinement and evaluation of ideas. This study offers valuable insights into the intersection of GANs and

human creative processes, as manifested in cGAI. By presenting empirical evidence from real-world professional environments, the case study has the potential to identify areas where GANs excel in supporting creativity and those where human intuition and expertise remain indispensable.

2.1.3. The current State of GAI and its Applications

Many experts and stakeholders in AI moved their attention to the integration of GAI (GAN-based) into the current workplace and future of work. Hughes et al. (2021) found that current advancements in this field have led to a growing trend of incorporating such models into various creative and design practices, primarily enhancing creativity and improving productivity. However, researchers claim that there is ongoing speculation about the impact of such AI systems on the future of work, with high uncertainty about the trajectory of this integration (Hughes et al., 2021). Nevertheless, technology has its most apparent impact on the field of art. Considering this, art is highly related to creativity, as humans often need creative skills to generate original and successful art pieces (Mazzone, 2019; Roose, 2022). Therefore, AI is already impacting the creative art industry as more platforms, such as Starry AI (2022), provide the necessary toolkits to use AI to publish NFTs.

Furthermore, Gruetzemacher (2022) emphasised in his research the potential of Generative AI language models in organisations, suggesting that they can assist strategic thinking and scenario-planning exercises. Despite the current limitations, the results obtained from these systems in research are already capable of delivering value in their current state (Gruetzemacher, 2022). This comparative case study aims to investigate GAI's impact across various industries, building upon the existing literature on cGAI in the creative industry and enriching the academic discourse on the cross-industrial impact of cGAI.

Over the past decade, only niche areas used generative artificial intelligence. For example, technology-assisted graphic designers created specific objects on their digital canvases or generated low-resolution imagery based on textual prompts (Cetinic & She, 2021). However, in both instances, it was readily apparent that a computer generated the output. The new era of cGAI, marked by the unveiling of OpenAI's GPT-3 and 4, has opened many doors for new use cases, as it operated in the form of conversations. Such a use case enables a more profound, context-based information flow that gives a new shape to how people interact with AI. OpenAI's chatGPT reached one million users within five days of its public launch, according to a tweet by CEO Sam Altman (Desk, 2023). This rapid growth surpassed any other public platform in the past, suggesting a considerably high demand for conversational AI technology and highlighting the platform's potential to support a variety of tasks and applications. This requires a more comprehensive, up-to-date examination of the current state of cGAI utilisation, more interestingly in the context of what is often considered the pinnacle of human ability: the creative process.

Currently, there is limited literature explicitly addressing the impact of cGAI on business or research processes, as most research tends to focus on the technical aspects of the models underpinning this technology. In contrast, practitioners contribute to the discourse by emphasising technological advancements or critically

examining their responsibilities and potential risks (Kasneci et al., 2023). Recognising this gap in the academic literature, this study aims to explore the shared characteristics between humans and generative AI, which may indicate how cGAI can potentially enhance creative processes in the workplace. Furthermore, by investigating this underexplored area, the research seeks to provide a more comprehensive understanding of the implications of cGAI in professional settings. Section 3.1.4 delves further into this aspect.

2.1.4. cGAI and the Human Being

To explore how cGAI can support human creativity, it is crucial to delineate the specific capabilities of the AI system and draw comparisons to human approaches in the creative process, as the conversational nature of the technology suggests a collaborative interaction between two relatively similar approaches. One of the significant characteristics of chatGPT is its logically constructed and well-organized writing style. One can see this from the output it generates. An inquiry's response usually opens with the main idea of the inquiry, followed by a detailed explanation. It ends with a summary unless a restricting prompt such as "Explain it to me in one sentence" is requested (OpenAI, 2023). This strategy results from reinforcement learning with human feedback (RLHF). In addition, chatGPT offers extensive and thorough responses (Guo et al., 2023). chatGPT is relatively impartial regarding prejudice and damaging information and offers no viewpoints on sensitive subjects like politics and discrimination. It refuses to respond to inquiries within its knowledge cut-off, currently September 2021 and declines to respond to inquiries it deems to lack sufficient information (OpenAI, 2023). chatGPT occasionally makes up information, particularly when responding to inquiries requiring expertise in a specific sector. For example, it could create legal provisions that address a legal issue. This demonstrates the requirement for further vigilance and a deep understanding of the language model behind it, as stated previously. As Guo et al. (2023) explain, humans tend to be more varied and subjective in their expressions. However, chatGPT's responses tightly focus on the issue, preferring objective solutions.

Furthermore, chatGPT produces formal replies, whereas human communication is more informal and uses humour, irony, and metaphors more frequently. In addition, chatGPT displays emotion less than people who employ a variety of punctuation and grammatical rules to describe their sentiments. In conclusion, chatGPT is an AI language model that prefers neutral and objective responses and provides orderly, logically constructed responses. However, in terms of literary style, subject matter, and emotional expression, it varies from humans (Guo et al., 2023).

Guo et al. (2023) emphasise that these features make chatGPT an excellent tool for deciphering terms and concepts, performing an experiment, and thoroughly comparing chatGPT-generated and human-generated content. In their research, different variables were tested, such as *honesty* (implying that the agent should not make up facts or mislead users), *harmlessness* (meaning that it should not produce inappropriate or hazardous material) and *helpfulness* (suggesting that it should offer specific and accurate answers to the user's inquiry). The results on the *helpfulness* variable were interesting, as participants overall believed that chatGPT's

response was more helpful than the humans'. Surprisingly, the data revealed in more than half of inquiries that chatGPT's responses were preferred in economics and psychology (Guo et al., 2023). These findings provide compelling evidence of the realisable value that chatGPT may offer. The preference for chatGPT's responses over human interaction, coupled with the comparatively lower cost of employing such technology, suggests that conversational AI exhibits traits of human-like contribution. Conclusively, this case study delves into the intricate relationship between conversational cGAI and the human approach to the creative process. This human competency underpins exceptional achievements in arts and sciences and enables one to adapt to changing demands (Baas et al., 2015).

2.1.5. Delving into Creativity: A Comprehensive Review

Significant intersections with the human being were discerned upon reviewing the latest innovations in NLP and its contemporary incarnation as cGAI. Besides, providing a comprehensive overview of the technology's history, background, and current state of the art aids readers in comprehending these tools' capabilities, even without firsthand experience. This case study, akin to research from Guo et al. (2023), aims to quantify elements that boost human capabilities. However, this research differs from current research as it includes a more in-depth exploration of the creative process. This section aims to provide three quantifiable aspects of the creative process to approximate the influence of cGAI on this crucial component of human cognition.

Corazza (2017) explains that placing human creativity at the core of the digital transition is essential, given the increasing significance of this skill in this era of necessary human-machine collaboration. By emphasising the centrality of creativity, we can better understand and navigate the evolving relationship between human intellect and AI capabilities (Corazza, 2017). For this purpose, the presented research encompasses this human-machine collaboration, ultimately grasping the expert's perceptions of its impact on tasks that require creative thought. Amabile et al. (1996) argue that creativity can be interpreted as the "seed for all innovation" as it plays a crucial role in the progression of organisations. Furthermore, enacting the individuals' ideas within the organisation impacts the motivation to generate new ideas (Amabile et al., 1996). This case study endeavours to address these considerations, as it aims to extrapolate valuable insights into cGAI's potential role in fostering an environment that nurtures innovation (generating new ideas for problem-solving) in the creative process.

In the quest to identify a method for measuring creativity, numerous models have been examined, each attempting to capture measurable elements of the creative process. However, a universal model remains elusive, with many either overly concentrating on psychological implications or primarily targeting childhood creativity. Nonetheless, the Creative Problem Solving (CPS) model introduced by Alex Osborn and Sidney Parnes in the 1950s offered a prominent method to assist individuals in addressing complex problems by generating innovative ideas and solutions (Osborn, 1963). The model contains key stages involving the recognition and clarification of the problem, besides the analysis of its context (*contextual awareness*). These

stages aim at encouraging creative thinking and endorse a wide array of possible solutions through *divergent thinking* (Osborn, 1963). To elaborate on the foundational knowledge J.P. Guilford originally introduced the term “divergent thinking” in psychology. This notion refers to the cognitive process fostering creativity by exploring numerous potential solutions (Guilford, 1950). This investigation scrutinises the elements as mentioned above as measurable factors intrinsic to the creative process, proposing their potential for significant enhancement via human-cGAI collaboration. Accordingly, the analysis utilises Osborn’s (1963) CPS model as concrete elements that could be affected by cGAI interaction. Further elaboration on this topic will be provided in subsequent chapters as the propositions will be presented.

Another framework attempting to measure creativity was the Geneplore model, first proposed by Finke, Ward, and Smith in 1992 (Ward et al., 2013; Finke et al., 1996). It comprises two primary phases of creative cognition: the Generative phase and the Exploratory phase. Overall, the model examines the cognitive processes involved in generating (mental representations of potential ideas or solutions, which can correspond to brainstorming and exploring by manipulating, evaluating, and refining creative ideas. Furthermore, the model highlights the iterative nature of creativity, wherein individuals may cycle between the generative and exploratory phases several times before arriving at the final creative output (Ward et al., 2013; Finke et al., 1996). Such aspects of the creative process will be referred to as *real-time support and feedback* for this case study, as it comprehends the cyclical evaluation and refinement of creative elements. Besides, the Geneplore model and GANs (section 3.1.2.) both reflect the iterative nature of creativity, with the former emphasising the cyclical relationship between generative and exploratory phases and the latter exhibiting the adversarial interplay between generator and discriminator networks. By considering these interconnected processes, we can better understand the potential for collaborative creativity between human and artificial intelligence systems in fostering and supporting the creative process. This case study endeavours to capture the perception of these iterative phases to foster creativity by considering the *real-time support and feedback* that occurs during interactions with a cGAI (Moruzzi, 2020). Finally, it has been found that in Social Agency Theory, individuals often conceptualize computers as social entities. This implies that they navigate their interactions with these digital devices akin to interpersonal human relations (Schroeder et al., 2013). Such a notion may allude to the existence of a reciprocal human-AI interaction/feedback cycle, a phenomenon which the component termed as real-time support and feedback is intended to encapsulate as well in the respective propositions in section 3.2.

Sielis et al. (2009) studied creativity support tools, a crucial component of computer science research, and a persistent challenge of devising computational methods to augment creativity. They examined widely used creativity support tools, concentrating on user interaction during the "preparation" and "ideation" phases of the creative process. This research will primarily focus on the "ideation" enhancement aspect. It represents a domain that does not necessitate direct interaction with multiple human individuals and can be considered the most vital creative process characteristic (Sielis et al., 2009). The "ideation" approach, briefly presented in the adapted table below, may be instrumental in identifying areas where cGAI can enhance the

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creative process, provided that cGAI is regarded as a creativity support tool within this case study domain. Consequently, the "cGAI Contribution" column in

Table 1 delineates the propositions this study intends to demonstrate, elucidating how cGAI can enhance the specified creative attributes within the creative process.

Table 1 – Support Tool Capacity Insights and cGAI Contribution (adapted from “Enhancing the Creativity Process by Adding Context Awareness in Creativity Support Tools”, Sielis et al., 2009, Lecture Notes in Computer Science)

| Creative attribute | Support tool capability | cGAI contribution <i>as proposed in the current study</i> |
|--------------------|--|---|
| Resources | Acquiring and utilising resources to foster a deeper understanding of an idea and stimulating the generation of new ideas within the same subject. | chatGPT as a knowledge resource: AI model for information acquisition. |
| Relevant ideas | Relevant ideas serve as a valuable guide for users seeking to expand their knowledge and resources on a given topic. It leverages insights and perspectives to access new reflection directions. | chatGPT is a novel and innovative idea generator - to seek broader idea generation. |
| Context awareness | Context awareness promotes creative problem-solving. Recognising inefficient and suggesting alternative approaches that enhance creativity can impact the quality and effectiveness of the creative process. | chatGPT to analyse user interactions and outputs, identify potential areas for improvement, and propose alternative approaches. |

This case study builds upon the findings of Sielis et al. (2009), which revealed that most support tools lacked real-time human-computer interaction, thereby impeding the effectiveness of the creative process. This is pertinent as contemporary cGAI, such as the chatGPT Plus subscription, enables close-to-real-time interactions using the GPT 3.5 model. Given the current advancements, it is anticipated to become even faster soon. Furthermore, Sielis et al. (2009) discovered that incorporating *context awareness* into creativity support tools could improve the creative process and promote innovation. Given the "conversational" attribute of cGAI and its ability to consider the context of a conversation when responding to prompts, as exemplified by chatGPT, such technology possesses the potential to fulfil the necessary conditions for an enhanced creative process.

The main objective of this study is to contribute to the expansive body of literature by Bernard (2023), Bieser (2023), Cetinic & She (2021), Davenport & Mittal (2022), Hughes, Zhu, & Bednarz (2021) that explores the connection between creativity and human-artificial intelligence interactions. Specifically, it illustrates the true capabilities of cGAI within the realm of the creative process, a broadly encapsulated notion in most human activities, including innovation, ideation, the generation of original viewpoints, and beyond. Table 3

in section 3.2 showcases how the previously mentioned body of research will be used in the conceptual framework to reference the developed propositions.

2.1.6. Reviewing Human Creativity with GAI's Integration into Work Processes

“Creativity is the ability to come up with ideas or artefacts that are new, surprising and valuable.”

(Boden, 1996)

This quote by Boden (1996) excellently depicts the main aspects of creative work, thought to be entirely reserved to human capabilities but recently reconsidered to be an anthropocentric skill only humans can thoroughly learn, hence the word “artefact,” etymologically meaning “made by the human”. Nonetheless, research indicates that providing a singular, universally accepted definition of creativity proves challenging, as scholars have proposed multiple definitions without reaching a consensus on a definitive interpretation suitable for all contexts (Simonton, 2018). Nevertheless, Moruzzi's (2020) research attempts to address this gap by proposing a multidimensional account of creativity that recognises problem-solving, appraisal, evaluation, and naivety as quantifiable characteristics in all creative processes. For clarity and coherence, this case study utilises Moruzzi's definition of creativity, which encompasses the abovementioned aspects: problem-solving, appraisal, evaluation, and naivety. The investigation attempts to use these aspects as measurement variables. In conclusion, these elements can be regarded as the aspects most significantly enhanced by the capabilities of cGAI.

GAI can potentially augment creative problem-solving (Moruzzi, 2020). By leveraging its vast computational abilities, it can support the exploration of various problem-solving avenues and stimulate the generation of new and innovative ideas. As discussed by Moruzzi (2020), creativity in problem-solving is centred mainly around the capability to make connections between seemingly unrelated pieces of information and knowledge. GAI can aid in this regard, leveraging its advanced algorithms to analyse large amounts of data and recognise patterns, ultimately suggesting novel and unconventional connections. This leaves the user agent deciding which ideas to consider for problem-solving. These connections could lead to a deeper understanding of the problem and provide new and innovative solutions (Davenport & Mittal, 2022).

In a later research stage by Moruzzi (2020), the creative problem-solving pattern involves a sudden insight or a trial-and-error sequence. In other words, it involves trying different options and evaluating their effectiveness until an effective solution is found. This highlights the importance of being willing to experiment and take risks in problem-solving, as finding a solution may take time and effort. It may require multiple attempts before success is achieved. In this view, as Moruzzi (2020) explains, the feedback loop between the generator and discriminator of GANs, mentioned in an earlier section, can be interpreted as an assessment procedure that, in some respects, simulates human trial and error. The system acts as a feedback mechanism,

a valuable method for all problem-solving tasks a human is assigned to complete. With such capabilities, this technology can assist in evaluating a larger quantity of perspectives on a specific problem, enhance brainstorming sessions, and develop alternative solutions to the existing problem, ultimately fostering the potential to assist in creative tasks.

3. Conceptual Model and Proposition Development

3.1. Building the Conceptual Model

The integration of cGAI can enhance creative problem-solving, given its ability to access and analyse vast amounts of data, recognise patterns, and suggest novel connections. Accordingly, the focus is on the novelty aspect (*divergent thinking*). Cramond et al. (2005) reported that originality and novelty are the best predictors of qualitative creative achievement, improving the creative process's measurable validity. Furthermore, the support tool capability of cGAI enables the exploration of problem-solving avenues, the generation of new and innovative ideas, and the evaluation of perspectives and alternative solutions. Creative problem-solving involves connecting seemingly unrelated pieces of information and knowledge, requiring experimentation and risk-taking (Cramond et al., 2005). GAI technology can leverage its computational abilities to augment the creative problem-solving process and simulate human creativity. In this research methodology, the impact of GAI on creative problem-solving is explored by investigating its potential to enhance the generation of new ideas and evaluate alternative solutions, ultimately fostering the potential to assist in creative tasks. Furthermore, the previously examined creative enhancement factors, including *context awareness and real-time support and feedback*, have been selected to elucidate the potential impact of cGAI on creative output. Accordingly, the adapted overview of these concepts is presented below.

Table 2 – Overview of Creative Elements, Categories, and Sub-categories in cGAI Applications based on literature review

| Creative element | Category | Sub-category |
|---------------------------------------|---|--|
| <i>Divergent thinking</i> | Encourage idea generation and brainstorming and foster the linking of disparate concepts | Provide a vast array of potential ideas |
| <i>Context awareness</i> | Understand the background of a given problem and recognise inefficient approaches, suggesting alternatives and providing the “bigger picture” | Offer relevant and context-based information, Support decision-making, multiple perspectives/idea evaluation, and propose alternative approaches |
| <i>Real-time support and feedback</i> | Receive timely guidance and critiques | Offer instant, adaptive, and context-aware responses |

The research focuses on the role of GAI in exploring various problem-solving avenues and enhancing *context awareness* for improved holistic problem-solving. By analysing the interviewees' perceptions of the capacity of GAI to make connections between seemingly unrelated information and knowledge, the study assesses the ability of cGAI to recognise patterns and suggest novel and unconventional connections, ultimately enhancing creative problem-solving. Furthermore, the research considers how participants perceived a change in their creative process by investigating their willingness to explore multiple attempts to pursue a viable solution (Real-time support and feedback). Additionally, in evaluating creative problem-solving, the feedback loop inherent in GANs can be exemplified by the dynamic interplay between the generator and discriminator and the simulation of human trial and error processes. This may suggest the presence of shared characteristics, thereby offering the potential to enrich a comprehensive workflow where multiple attempts at problem resolution prove valuable. Ultimately, the study attempts to ascertain the potential of cGAI in facilitating creative tasks by conducting in-depth discussions with participants regarding the technology's capacity to evaluate a larger quantity of perspectives on a specific problem, augment brainstorming sessions, and generate alternative solutions.

3.2. Outline of Propositions

To investigate within the context of the conceptual framework, the pursued study inspects propositions that emerge from integrating the extant literature on creativity and the technological underpinnings of cGAI with the overall comprehension of cGAI's implications. The proposition elaboration

below encompasses the role of cGAI in fostering (1) *divergent thinking*, (2) *context awareness* and (3) *real-time support and feedback*.

Proposition 1 posits that cGAI can enhance *divergent thinking* by generating a broader range of potential ideas and fostering connections between disparate concepts, thus improving creative problem-solving. This proposition is supported by research highlighting the unique features around logically constructed responses, the well-organised writing style of chatGPT (Guo et al., 2023) and the Generative AI's potential for augmenting creative problem-solving (Moruzzi, 2020). Lastly, this proposition aligns with Goldschmidt's (2016) notion of the human creative process, which requires a delicate balance between divergent and convergent thinking. While GANs may not capture the full complexity of human creativity's emotional, cognitive, and cultural factors, they mimic certain aspects, such as the continuous refinement and evaluation of ideas, which ultimately enhance *divergent thinking*.

Proposition 1: Using cGAI improves *divergent thinking* by generating a broader range of potential ideas and fostering connections between disparate concepts, enhancing creative problem-solving.

Proposition 2 focuses on depicting the cGAI's potential to enhance *context awareness*, which is very impactful in the creative process (Sielis et al., 2009). It is proposed that by supplying pertinent information, pinpointing inefficient methods, and suggesting alternative solutions tailored to a particular context, cGAI can improve *context awareness*. This proposition is consistent with the findings of Sielis et al. (2009), who highlighted the importance of incorporating *context awareness* into creativity support tools to improve the creative process and foster innovation. cGAI, as exemplified by chatGPT, possesses the potential to meet the necessary conditions for an enhanced creative process due to its "conversational" attribute, which enables it to consider the context of a conversation when responding to prompts. By facilitating a conversation-based human-computer interaction and providing contextual awareness, cGAI offers a unique advantage compared to traditional creativity support tools (Sielis et al., 2009).

Proposition 2: cGAI improves *context awareness* by providing relevant information, identifying inefficient approaches, and suggesting alternative solutions around a specific context, enhancing the creative process.

Lastly, proposition 3 asserts that cGAI can enhance the creative process by providing *real-time support and feedback*, delivering timely, adaptive guidance that improves the quality of solutions. Proposition 3 connects with Proposition 2, as *context awareness* is substantially related to *real-time support and feedback*. This proposition aligns with the observations of Sielis et al. (2009), who emphasised the significance of real-time human-computer interaction for the effectiveness of the creative process. Their research revealed that most support

tools needed to have such interaction, which hindered the creative process. In contrast, contemporary cGAI, such as chatGPT, enables close-to real-time interactions by leveraging advanced models like GPT 3-5, offering a distinct advantage over traditional creativity support tools. Moruzzi (2020) further highlights the importance of *real-time support* in the creative process by examining the iterative phases of creativity, which involve the continuous generation, exploration, evaluation, and refinement of ideas. By offering *real-time support and feedback*, cGAI can facilitate these iterative phases, fostering a more dynamic and effective creative process.

Proposition 3: cGAI enhances *real-time support and feedback* by offering timely, adaptive, and context-aware guidance, improving the quality of solutions, and enhancing the creative process.

Table 3 below provides a structured presentation of the key aspects of the previous discussion about the creative process and its intersections with the proposed research propositions. Each element of the creative process has been linked with relevant literature to underline and aim to quantify the impact of cGAI in creativity enhancement.

Table 3 – Linkages between key creative process elements, relevant literature, and proposed research propositions

| Creative Process Element | Associated Literature | Proposition |
|--------------------------------|--|--|
| Divergent Thinking | Corazza (2017); Osborn (1963) – CPS Model; Finke et al. (1996) – Geneplore Model | Proposition 1: Using cGAI improves <i>divergent thinking</i> by generating a broader range of potential ideas and fostering connections between disparate concepts, enhancing creative problem-solving. |
| Context Awareness | Corazza (2017); Osborn (1963) – CPS Model; Finke et al. (1996) – Geneplore Model | Proposition 2: cGAI improves <i>context awareness</i> by providing relevant information, identifying inefficient approaches, and suggesting alternative solutions around a specific context, enhancing the creative process. |
| Real-Time Support and feedback | Finke et al. (1996) – Geneplore Model; Sielis et al. (2009) | Proposition 3: cGAI enhances <i>real-time support and feedback</i> by offering timely, adaptive, and context-aware guidance, improving the quality of solutions and enhancing the creative process. |

Figure 1 – Reduced Conceptual Framework for cGAI and Creative Performance

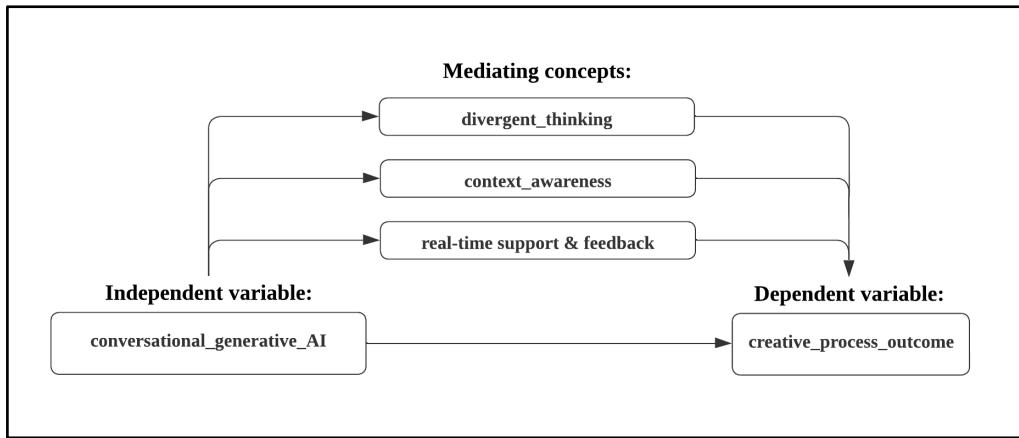


Figure 1 provides a comprehensive overview of the conceptual framework with its independent variable (IV), dependent variable (DV), and mediating concepts (MedC). As this paper investigates the improvement in creative performance through conversation with a cGAI language model, the DV is denoted as “creative_process_outcome” and the IV as the use of “conversational_generative_AI”. In particular, the presented mediating concepts are evaluated by thoroughly investigating participants’ perceptions concerning the amplification of the creative process because of these elements, with the express purpose of revealing the positive association between the dependent and independent variables.

4. Methodology

4.1. A qualitative case study approach

Given the nascent nature of the cGAI field, a qualitative case study approach has been deemed most appropriate for this research, as it provides a superior degree of flexibility compared to alternative qualitative methodologies, such as grounded theory or phenomenology (Hyett et al., 2014). Moreover, considering the rapidly evolving and expanding landscape of technological advancements, it is increasingly essential for technology research to employ more field-based research methods (Voss et al., 2002). Lastly, considering the widespread adoption of cGAI tools (i.e., chatGPT), collecting individuals’ perceptions of this technology through interviews presents a unique opportunity to evaluate its current impact on creativity. This nuanced understanding of the technology’s creative influence is difficult to achieve through purely quantitative approaches, further justifying the choice of a qualitative case study methodology for this research.

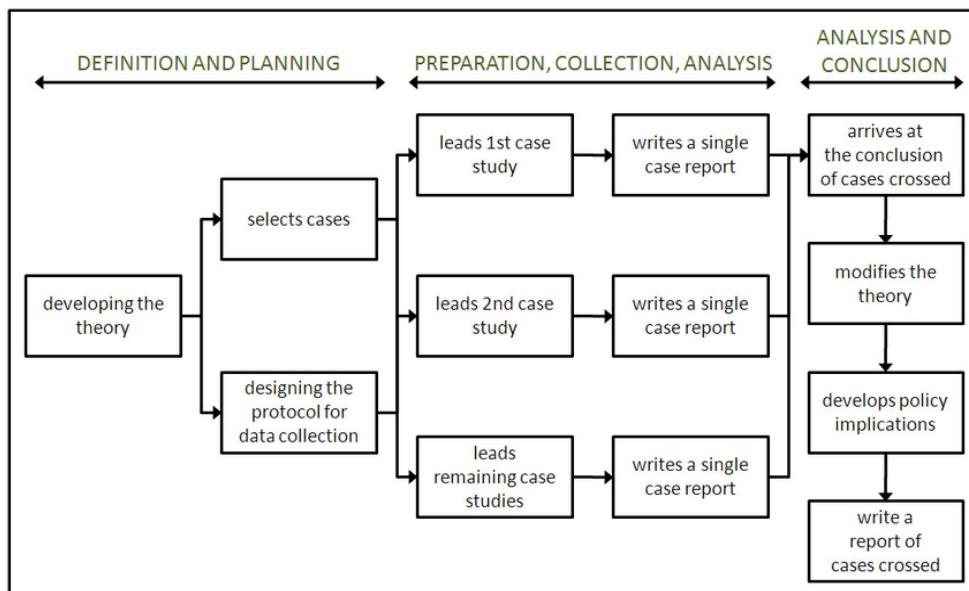
This case study seeks to extrapolate holistic perceptions from interviewees’ experiences during conversations about cGAI and the creative process. Consequently, this research considers the most academically grounded potential factors that may influence or contribute to the relationship between the

discussed interactions with cGAI and the participants' perceptions of its effect on creative output. In alignment with this goal, the conceptual framework incorporates mediating concepts to identify potential correlations accurately. The following section presents a detailed explanation of the research design, data collection method and analysis techniques. However, the focus will be on the study approach, such as semi-structured interviews.

4.2. Research design

In this case study, the research methodology follows a deductive approach, utilising the previously mentioned conceptual model consisting of concepts derived from the literature review for the coding process (Azungah, 2018). This framework, commonly known as a start list (Miles & Huberman, 1994), is applied throughout the analysis with the expectation that key concepts from the literature will emerge from the data (Bradley et al., 2007). By integrating the deductive approach into the case study methodology, while not conclusive, the evidence from this investigation points towards the propositions derived from the literature while providing room for new insights and themes from the qualitative interviews. By identifying patterns

Figure 2 – Case study methodology (adapted from “Case study research: design and methods” by Yin, 2003, Sage Publications, Vol. XVI, ©2003) Case Selection Protocol



within the qualitative interviews that correspond with the initial propositions, the research not only substantiates these propositions but also facilitates a rigorous analysis, merging the advantages of literature-based research with empirical qualitative analysis. The research design by Yin (2003) is compatible with the current method and will guide the conduction of this study. This investigation meticulously adheres to Yin's (2003) recommended methodology, presented in Figure 2 above, encompassing the three stages: "Definition

and Planning", "Preparation, Collection, Analysis", and "Analysis and Conclusion". Each stage comprises intricate sub-segments, which have been systematically implemented and executed in this study concurrently.

The recent proliferation of cGAI, facilitated by readily available and powerful free services such as chatGPT, has led to the widespread adoption of this technology (Baruffati, 2023). Consequently, numerous organisations are actively pursuing AI-driven transformations and enhancing their automation capacities across various sectors (Chui et al., 2022; Desk, 2023). This trend presents a high availability of potential case studies pertinent to the current research. As the random case selection is not ideal (Eisenhardt, 1989), a clear protocol is employed to select comparable cases for this study. The protocol refers to the guidelines or criteria followed during case selection, ensuring that the selected cases are relevant, comparable, and representative of the research context. This study, therefore, focuses on ordinary but representative cases, adhering to the following criteria during selection, which is explained in detail in sections 4.2.1 and onwards.

4.2.1. Case Selection

This case study employs an embedded multiple-case analysis method to investigate the perspectives of both practitioners and academics regarding the utilisation of cGAI in creative contexts (Yin, 2003). Therefore, a comparative case study examines and contrasts the perceptions of the two distinct sectors (cases), namely the *economic sector*, representing the business and commercial professional domain, and the *scholarly domain*, encompassing the realm of researchers and scientific investigators. Such comparative analysis allows for identifying similarities and differences between the sectors' perceptions of the technology, enhancing the study's validity and reliability (Eisenhardt, 1989). In this context, the units of analysis are various organisations/firms and universities, referred to as Company 1, Company 2, Company 3, University I, University II, and University III, respectively.

4.2.1.1. Tech-related Economic Sectors and Scholarly Domains

The present study employs a purposive sampling technique to select cases that pertain to or are directly involved in the technology-intensive industry. Even if it does not always seem straightforward to analyse the technology-intensive industry in the context of creative processes, tech-intensive industries are becoming highly innovative due to enhanced knowledge and technological and managerial capabilities (Camisón-Haba et al., 2019). Additionally, following the conclusions by Amabile et al. (1996) stating that creativity is the “seed of all innovation”, it incentivises the decision to investigate in such an industry. Furthermore, pursuing such selection also enables more in-depth and fact-oriented discussions that can provide a more realistic scope of the present perception of the technology rather than potential fearful views on how it would replace jobs rather than enhance them (Borland & Coelli, 2017). Moreover, the objective is to identify organisations and academic departments that promote and engage with cutting-edge technologies, such as AI and cGAI, respectively, focusing on harnessing their potential for the ultimate benefit of societal

welfare. Lastly, it is important to note that in technology-intensive industries, universities with a significant focus on technology and research departments specialised in Data Science and artificial intelligence are considered and invited to participate in this study. Academic participants from cross-disciplinary departments, such as those affiliated with the Erasmus Centre for Data Analytics at Erasmus University, will also be included in the research.

4.2.2. Location

The exclusive selection of local organisations and academic institutions may not encompass the complete range of desired perceptions for the current study. Consequently, a broader international selection, encompassing the EU and the U.S., could more effectively identify diverse perspectives on the study's objective and yield insightful results accordingly (Ghauri & Firth, 2009). Accordingly, the current research has engaged candidates in the Netherlands, Germany, Switzerland, Italy and California (U.S.). Given the extensive networking opportunities provided by platforms like LinkedIn, pursuing international candidates was highly prioritised to enhance the research's validity.

4.2.3. Comparability

To ensure cross-case comparability and maintain simplicity in the case study research, two distinct approaches have been implemented. First, a common cGAI model, chatGPT, has been selected for investigation. Open AI's freely accessible chatGPT, with its widely recognised and well-established language model, enables this research to effectively compare the impact and implications of cGAI across various cases while maintaining a consistent framework (Banerjee et al., 2018). Additionally, it becomes more straightforward to identify parallel AI-driven creative performance, ultimately fostering homogeneity among diverse organisations and sectors. Second, given the semi-structured nature of the interviews, it was crucial to present identical scenarios to all participants to facilitate a consistent framework for sharing their perceptions and experiences. This approach aimed to ensure that the discussions revolved around the same scenario, enabling comparative analysis. Additionally, the discussion questions were designed to be similar, although slight variations were introduced in certain cases to capture a wider range of insights and experiences of the interviewee. These tailored questions allowed for a more individualised exploration of each interviewee's perspective, aiming to improve the overall depth and richness of the discussions.

4.2.4. Convenience

Access negotiation is the initial step in the case study process and is thus vital for selecting cases (Pan & Tan, 2011). In this research, convenience considerations play a role in choosing organisations and academic institutions. Firstly, existing relationships with target organisations or academic departments facilitate access negotiations, providing the additional benefit of having informants available for deeper research insights. Secondly, the focus is on selecting cases already engaged with chatGPT, enabling a

consistent comparison framework, and aligning with the research objective of exploring cGAI impact. These convenience choices could have downfalls and potential pitfalls covered in the research limitations section.

4.2.5. Selected Cases

After carefully considering different opportunities, two main cases and five sub-cases for each have been identified and meet the criteria. These include business and engineering universities and organisations in the EU and US zone. These institutions and organisations are involved in the cGAI project, as all share a mutual interest in innovative technology and the potential applications that can be derived from it to enhance various outcomes. All cases have been anonymised to preserve confidentiality and promote open information sharing. The corresponding cases are designated by *economic sector* and *scholarly domain* with respective units of analysis: Company 1, 2 … 5 and University I, II, … V, respectively. This is done to preclude any association with the organisations involved. Subsequently, a case report is provided for each case before formulating cross-case conclusions are provided.

4.2.6. Case Study Protocol

Case study protocols improve reliability and replication while reducing bias and mistakes made during the research's execution (Yin, 2003). In embedded multiple-case analyses, it is necessary to follow such a protocol, which contains instructions on how to carry out the entire investigation. Drawing upon Paré's (2004) framework, the essential components of a case study protocol include an overview, field procedures, an interview guide, and a case study report guide. The following sections further elaborate on these elements within the case study process.

4.2.7. Field Procedures

To enable systematic data collection, field procedures are employed as an effective instrument. An information-source grid is created to help organise the interviewees' responses in a structured manner, facilitating subsequent data analysis in the research process. This method applies to all cases under consideration and can provide a cohesive framework to bolster comparability.

4.2.8. Interview Guide

The proposed interviewing procedure comprises two primary elements and is designed to last between 45 to 60 minutes. The initial component seeks to pose a series of screening questions to the participant to collect background information, contextualising the respondent's answers and ensuring that the gathered data is relevant and valuable, in line with the case selection criteria. To evaluate the participants' expertise in these domains, these screening questions encompass inquiries about educational history, professional experience, industry, and familiarity with topics such as GAI, AI, Creativity Studies, NLP and cGAI. These are denoted in Table 4 as Generative_AI_fam, AI_fam Creativity_Studies_fam,

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NLP_fam, chatGPT_fam, and Conversational_GAI_fam, respectively. The screening process outcomes are represented in a tabular format, as shown in Table 4 below.

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Table 4 – Participant Screening and Background Information

| Participant ID and unit of analysis | Age | Professional background | Academic background | Industry/Field | Experience with cGAI |
|--|------------|---|---|--|---|
| Participant id_1 / University I | 32 | Research Associate (Philosophy Department) at University of Kostanz | Ph.D. in Philosophy/Music (piano) (UK); MA/B.A in Philosophy (Italy); | Philosophy, AI, and Creativity | AI Social Impact Research, Creative Sector Exploration, AI in Arts, Technology Impact Analyst |
| Participant id_2 / University II | 27 | Teaching, AI startup internship, co-founder | Automation Engineering & Data Science, Milan & Zürich | AI, Machine Learning, Start-ups | Large Language Model Developer & Implementor |
| Participant id_3 / University III | 26 | Labour rights garment industry (Asia) | Political Science, Sustainable Development (currently PhD) | Non-profit Research, Healthcare & Pharma, Technology, | AI Social Impact Research, Creative Sector Exploration, AI in Arts, Technology Impact Analyst |
| Participant id_4 / University IV | 30 | Professional Actor and Philosophy Researcher | Masters in Chemistry, Drama School, and Philosophy | Theatre, Education, Writing | Generative AI Implementor in Drama Industry |
| Participant id_5 / University V | 33 | Financial Consultancy, Banking, Education | Economics and Business (BSc), International Management (MSc), University of Amsterdam | Economics, Business, International Management, Education | ChatGPT Workshops, AI in Education, Generative AI Implementation, Education Innovator |
| Participant id_6 / Company 1 | 28 | Startup Marketing, Freelance developer for 3-4 years, founder of 4 startups | Economics and Business (BSc), University of Amsterdam | Developer, System Integrator, ML - Solutions | Daily chatGPT user |
| Participant id_7 / Company 2 | 45 | Company Founder | Engineering (dropped out) | IT services (25 years), (Wireless) Fundraising for Startups, Analytics | chatGPT solution development, AI tools for Data Analytics & Forecasting |
| Participant id_8 / Company 3 | 43 | Director at Design firm; UX Researcher & Strategist at Google | Marketing MSc at University of Leeds and Strategy & Innovation MA University of Oxford | Applied research and tech integration, Data Analytics, Strategy | Position as Generative AI Strategy and UX at Google |
| Participant id_9 / Company 4 | 30 | Data Scientist & Behavioral Scientist, Consultant in Data Engineering, Teacher and Non-Profit Teacher | BSc & MSc in Psychology from Groningen, Netherlands | Applied research and tech integration | cGAI workshops, Prompt Engineering workshops, Large Language Model Implementator |
| Participant id_10 / Company 5 | 26 | Innovation Strategist Data Analytics Tech Community Engagement University Experience Entrepreneurship | BSc in International Business (focus on Developmental Economics), Master's in Business Information Management | Academia, Tech, Education, Food System Transitioning | Member of Data Analytics Research Centre |

4.2.9. Academic Integrity

In maintaining academic integrity and abiding by research standards, the data collection process for this research was explicitly designed to ensure it only served academic purposes. There was no commercial use of any collected data, and no misuse of any findings. This included adhering to principles of honesty, rigour, and transparency throughout the research, starting from the proposal phase, through data collection, and analysis.

All interviewees were informed beforehand about the purpose and procedure of the interviews. Participants were briefed in detail about their rights and were told explicitly that their participation was entirely voluntary. They were also informed that they could refuse to answer any specific questions or disclose information they were not comfortable sharing. All interviewees were aware that the interviews were confidential, their identities would be anonymized, and their responses would be reported in a way that would not enable identification. This built a level of trust that, although only two participants agreed to sign the Informed Consent Form – a document outlining the study’s purpose, procedures, confidentiality measures, and participant rights, designed in line with recognised confidentiality forms utilised in professional research departments – all participants expressed their agreement to partake in the research and its conditions verbally, reinforcing the trust-based relationship established during initial discussions.

Moreover, following ethical standards and data protection laws (GDPR), all personally identifiable information collected from the participants was and will be kept confidential and securely stored (European Parliament & Council of the European Union, 2022). To further guarantee the binding nature of this commitment, each participant is respectfully requested to sign an Informed Consent Form outlining the study’s purpose, procedures, confidentiality measures, and participant rights, which has been developed concerning other confidentiality forms utilised in professional research departments and can be found in Appendix (7.2). Nevertheless, only two out of ten respondents were willing to sign the document, considering it unnecessary due to their initial trust established in discussion.

The second component involves presenting comprehensive scenarios connected to the propositions, inquiring about the participant’s perception of the given scenarios, and soliciting further elaboration on their point of view regarding the expected outcomes. The objective is to encourage participants to explain and justify their decisions thoroughly. The appendix offers a detailed example of how this approach will be employed throughout the interview sessions. Nonetheless, the final interview guide may undergo modifications as potential refinements will be considered.

4.2.10. Scenario-based Interviews

Scenarios will be crafted carefully to depict realistic situations involving the interaction with cGAI during creative processes. Such will be presented to participants and incentivised to share their insights as they relate to each scenario, ultimately facilitating the understanding of their perceptions and allowing in-depth exploration of the discussed subject.

A brief synthesis of the existing literature and media sources at the beginning of the discussion illustrates the study's aim to enhance comprehension and promote further investigation into how organisations employ cGAI for creative tasks. The study seeks to demonstrate the technology's potential to augment (1) *divergent thinking*, (2) *context awareness* and (3) *real-time support and feedback*, as delineated in the conceptual framework and methodology in previous sections. An example of such an overview can be found in the appendix of this document, titled "Interview Overview – Screening and Scenario-based Questions." In this document, scenarios are presented after the screening questions used to gather insights on whether different backgrounds indicate different perceptions of creative enhancement. In the provided scenarios, interviewees are prompted to contemplate the role of cGAI in specific situations related to *divergent thinking*, *context awareness*, and *real-time support and feedback* within creative processes. By reflecting on the potential benefits and drawbacks of cGAI in these situations, interviewees are encouraged to offer their perceptions and insights. This approach fosters a comprehensive understanding of participants' views on the expected outcomes and stimulates them to elaborate on and justify their decisions thoroughly.

In the first scenario involving enhanced *divergent thinking*, respondents are invited to discuss their experiences within a multidisciplinary team striving to construct an innovative product portfolio for a consumer electronics enterprise. This company is currently grappling with creative stagnation and is endeavouring to harness the power of chatGPT to bolster its product development. Respondents are then asked to delve into the cGAI's facets impacting their creative processes. This is accomplished through four questions on the influence on the team's abilities, the degree of integration between unrelated concepts or disciplines, including alternative viewpoints, and a prospective evaluation of the team's ideation evolution.

In the second scenario, which focuses on *context awareness*, participants are encouraged to reflect on how cGAI may facilitate their creative workflow in a design task. Here, the contextual prowess of chatGPT is evaluated as it attempts to streamline workflow and manage the needs of sticking to higher management's stipulated requirements. Initially, participants are queried on the impact of chatGPT on their ability to fulfil the requirements whilst concurrently maintaining a creative focus. Lastly, they are asked to expand upon cGAI's capacity to grasp the broader context of the problem under consideration.

The third and final scenario addresses *real-time support and feedback*, where interviewees are facilitated to explore the possible benefits of using cGAI during a complex project involving multiple attempts at problem-solving, constant collaboration and feedback-looping with the fast chatGPT model. Notably, for those interviewees subscribed to chatGPT Plus will likely yield more favourable responses.

Subsequently, participants are asked to discuss their capability to offer real-time client support and feedback and reciprocally reflect upon receiving feedback from the cGAI. Lastly, they are asked to juxtapose the feedback abilities of a human colleague and an AI. These specific scenarios are designed to foster robust discussions, encouraging respondents to provide insights into the role of cGAI and drawing connections with their experiences. However, this section does not encapsulate all sub-questions designed to stimulate

discussion and elicit unique perspectives; these are found within the interview transcripts presented in section 11.3.

4.2.11. Case Study Report Guides

A case study report guide has been devised to present the key data obtained effectively. There are three crucial components to consider when employing the proposed strategy for these reports:

1. Formatting should provide a consistent framework appropriate for all cases.
2. The logical progression of information should dictate the structure of the overall report.
3. Maintaining a high level of readability is essential for obtaining valuable participant feedback.

Moreover, each case report includes a comprehensive background summary to familiarise readers with the situational context. Finally, a case summary and practical conclusions are incorporated for each case. In contrast, these conclusions may not necessarily determine the overall study's findings; they offer valuable perspectives on the cases conducted. Lastly, it is important to mention that the case reports present in a detailed fashion what topics were touched upon by the interviewees when the latter were stimulated and indirectly incentivised to discuss elements (1), (2), (3), respectively.

4.3. Data Collection

The interviews are conducted individually, online or face-to-face, depending on the participant's preference and availability. The semi-structured interview protocol allows flexibility and in-depth exploration of the discussed subject while adhering to a structured format for comprehensive and relevant data collection. In addition, the questions were carefully selected to explore participants' experiences and perceptions of using cGAI language models for creative tasks. A more detailed showcase of the question design is presented in the Appendix. Finally, as explained earlier in this chapter, the interview guide includes screening questions and comprehensive scenarios connected to the propositions.

A primary motivation for conducting interviews is the accessibility to experts in the field of Generative AI and creativity, who ultimately have the potential to bring considerable value to the research. These experts comprise a Research Associate at the Department of Philosophy, University of Konstanz, specialising in the social impact of Artificial Intelligence technologies in the creative sector, and an Advisor at Chelonia Applied Science, focusing on multilingual language models and adversarial learning, as well as a Research Engineer at an AI Customer Service company.

The proposed data collection procedure in the present case study uses scenario-based interviews to thoroughly explore the impact of cGAI in various professional contexts. Drawing inspiration from Adler and Patahuddin (2012), the approach presents participants with carefully crafted scenarios for using cGAI in

creative problem-solving and other relevant applications. These scenario-based prompts are designed to provoke in-depth discussions and insights into the participants' experiences and perspectives on cGAI improving *context awareness*, problem-solving exploration, *convergent thinking*, connecting unrelated information and evaluating diverse perspectives for brainstorming and alternative solution generation.

The semi-structured interview design facilitates flexibility and an in-depth examination of the topic while maintaining a structured format for complete relevant data collection. Conducting interviews allows for gathering valuable perceptions and experience-based insights, significantly enhancing the understanding and credibility of the research findings. Before participating, participants received comprehensive but limited information about the study's goals, methods, and rights. Participants informed consent for voice and video recordings is obtained to address ethical concerns. In conclusion, it is essential to acknowledge that, despite concerted efforts to uphold an objective approach throughout the research process, the potential for the persistence of interpretative bias cannot be eliminated (Corbin & Strauss, 2015).

4.3.1. Interviewee Selection

The semi-structured interview serves as this study's primary means of data collection. The interview participants are selected through purposive sampling, as individuals with more experience working with GAI are preferred to assess the predictions on its impact on creative performance. The recruitment process for this study identified over 50 individuals who potentially had relevant experience and knowledge about cGAI. These individuals were approached through LinkedIn and personal email communication. All participants were provided relevant information about the study's purpose ensuring voluntary involvement and anonymisation. Furthermore, the snowball sampling technique has been selected as the most suitable method to identify and recruit participants with experience and/or knowledge about using cGAI in various professional contexts (Ishak & Bakar, 2014). This technique involves starting with a small number of participants who meet the study criteria and subsequently requesting recommendations on other individuals who could possess relevant experience or knowledge about cGAI (Goodman, 1961). To implement this approach, participants contacted and interviewed are asked to refer to other individuals with relevant experience willing to participate in the study at the end of each interview. Subsequently, referred individuals were contacted, and the snowball sampling process was repeated until sufficient participants were reached to cover cross-industrial sectors orbiting technological innovation for corporate and cross-disciplinary departments for academic participants. Additionally, the research adopts a deliberate strategy to engage participants from various experience levels and diverse roles within cGAI utilisation. This approach ensures maximum variation among the participants, fostering a more comprehensive understanding of the phenomenon under investigation.

Moreover, the study will incorporate interviewees who may not be directly involved in the specific application of cGAI but maintain associations with the target organisations or industry. These participants are expected to provide relatively unbiased perspectives on the influence of cGAI on their creative

performance. Furthermore, the research prioritised meticulous documentation for each case report, encompassing exhaustive information on all interviews conducted, including the interviewees' roles, the date and time of the interviews, and the completion date of the transcriptions (Boyce et al., 2006; Zuckerman, 2019). This practice aims to bolster the research process's transparency and rigour. By employing these selection strategies, the study facilitates a more in-depth and multifaceted understanding of the subject across various professional contexts.

4.4. Data Analysis

The qualitative stage is the most challenging part of a case study (Eisenhardt, 1989). As codification can be challenging for qualitative information, this research focuses on keeping a coherent structure as much as possible in the data analysis. After gathering the interviewees' transcripts, propositions were revisited to match the findings (Paré, 2004). The qualitative data analysis procedure employs scenario-based interviews as the primary method, complemented by a multi-method analysis approach.

4.4.1. Transcription and Data Organization

Interviews are transcribed verbatim using the open-source general-purpose multi-lingual speech recognition model developed by OpenAI, named WhisperAI (OpenAI, 2021). This sophisticated software, trained extensively on a comprehensive and varied compilation of audio data, boasts a remarkable level of precision and reliability. This powerful software proved to be highly advantageous for this case study because of its ability to operate entirely offline, residing solely on the local machine, ensuring the privacy of shared information and the interviewees' personal data is effectively safeguarded within a secure and closely supervised environment, ultimately complying with GDPR guidelines.

Following revising and categorising all interview transcripts, they were organised into separate .txt files, compatible across multiple platforms. Subsequently, data familiarisation was achieved by summarising key perspectives expressed by each interviewee and deploying all newly gathered insights into an extensive Excel table, offering a comprehensive overview of various elements, including Age, Professional Experience, Industry or Field of Study. Additionally, the extent to which each participant concurred with Propositions 1, 2, and 3 was briefly mentioned, alongside their perceived familiarity with the subjects addressed in the Interview Overview (refer to the appendix).

4.4.2. Qualitative Data Analysis

A thematic analysis is proposed to identify recurring themes, patterns, and concepts in the interview transcripts that could potentially agree with the presented propositions or deny them to some extent. This process involved codifying data, generating themes, and interpreting the findings accordingly.

4.4.3. Coding

Once transcriptions are gathered, the coding of such unstructured data is essential (Paré, 2004). In adopting a deductive approach to qualitative analysis, this study focuses on predetermined codes and categories derived from the previously presented conceptual framework. Accordingly, to achieve a more detailed, unbiased, and broad analysis, only the three main categories of investigation: (1) *divergent thinking*, (2) *context awareness*, and (3) *real-time support and feedback* were predetermined. All subcategories and concept labels were gathered throughout the analysis to identify the interviewees' perceptions.

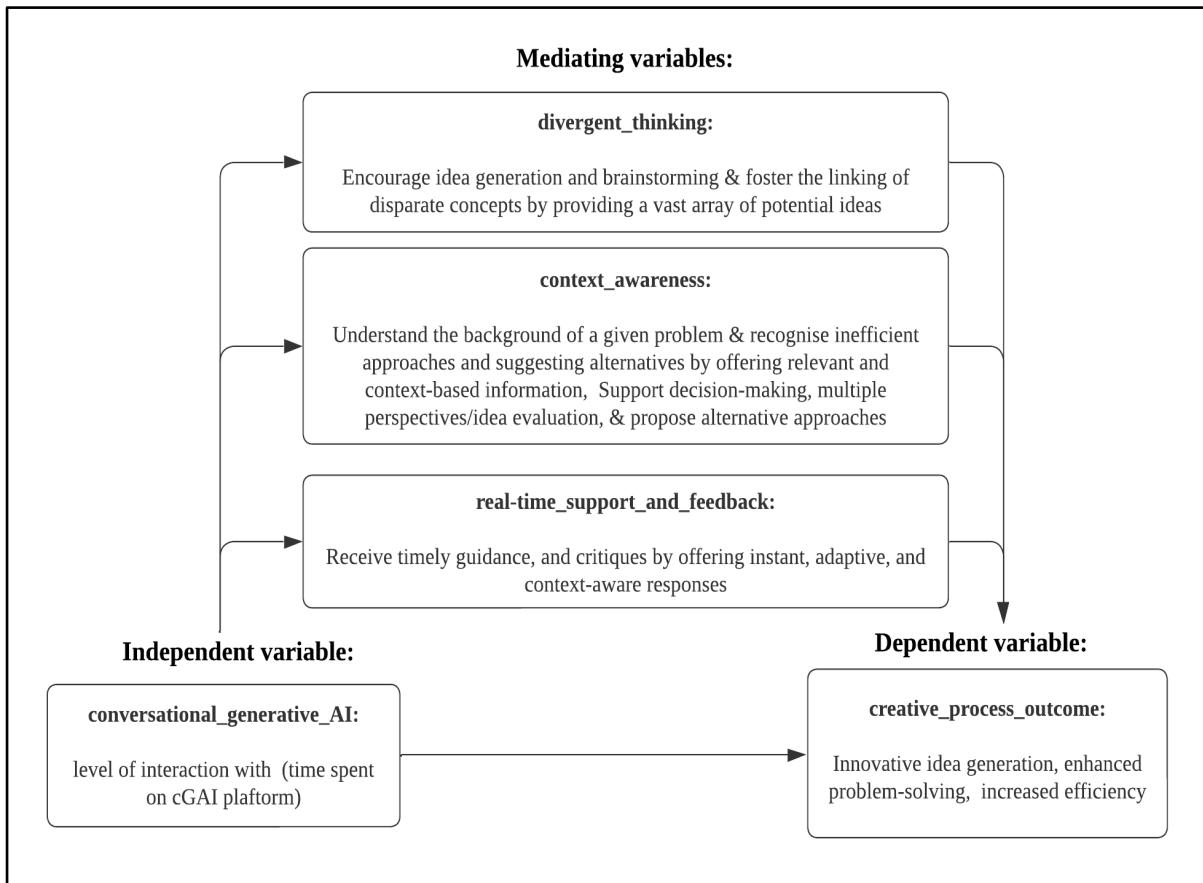
This modus operandi allows for a systematic analysis through template analysis, proposed by Symon and Cassell (2012). The coding template encompasses higher-order themes and subthemes, which will be further refined upon conducting initial interviews to yield a more detailed coding template. These themes and subthemes aim to project the propositions' implications, as Symon and Cassel (2012) outlined. Once the semi-structured interviews are completed, relevant segments of transcript text will be assigned to appropriate codes or categories. Establishing conceptual labels for events and interactions permits further categorisation of information derived from the transcripts, ultimately enabling the comparison of similarities and differences across varying interviewees' perceptions of specific concepts. Accordingly, it will be interesting to determine whether the logical flow underpinning the propositions can also be identified in the logical flow emerging from the interviews from each case. Employing this thematic analysis facilitates the identification of such reasoning patterns, thereby contributing to a more comprehensive understanding of the phenomena under investigation (Symon & Cassel, 2012). For the qualitative analysis of the data collected in this study, the digital software tool "Atlas.ti" was utilised alongside thorough manual analysis through reviewing and interpretation. Atlas.ti is a widely recognised software tool in qualitative research that provides various tools and techniques for organising, managing, and analysing data (ATLAS.ti Scientific Software Development GmbH, 2023). Finally, it is essential to note that categories falling beyond the scope of this research will be presented but not subjected to further analysis (Corbin & Strauss, 1990).

Figure 3 presents an expanded version of the conceptual framework. As a valuable reminder, this enhanced conceptual framework incorporates detailed descriptions intended to prognosticate the themes broached during the interviews.

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Figure 3 – Complete Conceptual Framework for cGAI and Creative Performance

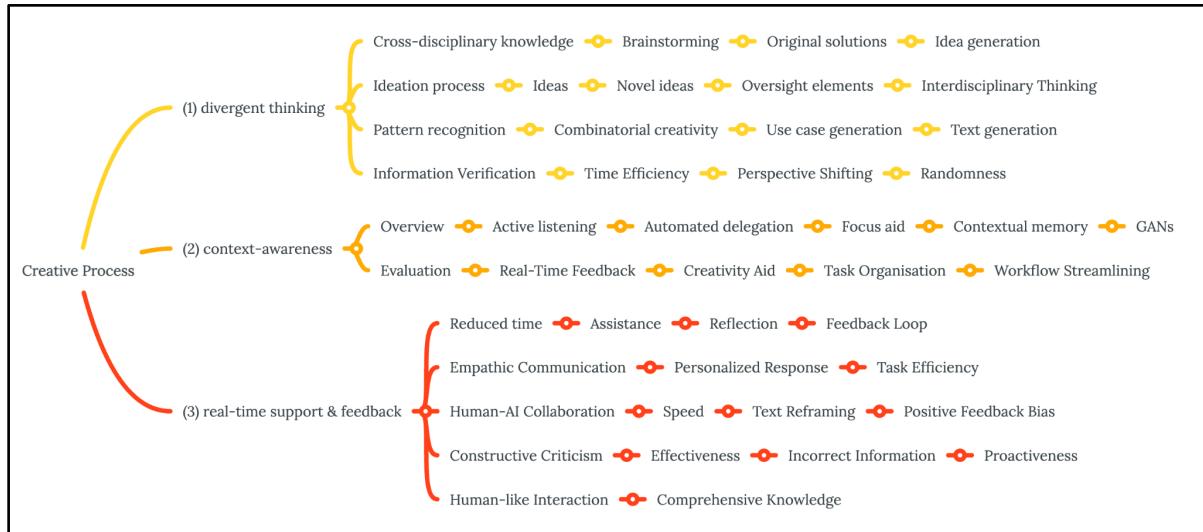


A summary table has been created to provide an overview of the conceptual labels delineated within the framework and facilitate their identification of themes during the analysis of transcripts in later sections. This table, together with the complete data analysis procedures and outcomes, are available in an online, downloadable .zip file in section 11.4. This table was subsequently transformed into a comprehensive mindmap in Figure 4 to facilitate understanding. Accordingly, the higher-order terms represent the three main moderating attributes of the creative process enhancement (1), (2), (3). The identified subthemes were found in the transcripts throughout the analysis, resulting in a combination of discerned themes through the deployment of both ATLAS.ti and manual rationale during the perusal of the interviews. Figure 4 depicts the interrelations between the main themes and subthemes. However, it is essential to note that the graphical representation does not include every identified conceptual label but rather every sub-theme. Approximately ten conceptual labels were confined within each subtheme and are available inside the Excel document in the designated repository-zip file. However, not all are visually represented in the illustration below due to clarity and space constraints.

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Figure 4 – Key themes for coding procedure ((1), (2), (3)) and identified subthemes



4.4.4. Qualitative Analysis

The findings from this study provide indications that align with the existing literature through multiple sources of evidence (i.e., participant interviews) and by triangulating the data, enhancing the results' reliability and validity. The collected data from the interviews are transcribed verbatim and analysed using qualitative content analysis. The reason for this decision resides in the flexibility of the analysis design, as it is a standardised method that can be used on both interview recordings and speech transcripts (Elo & Kyngäs, 2008).

This research acknowledges the drawback of this analysis method, reliability. One-on-one interviews fit well to get in-depth insights into a subject. However, the subjective aspect of these interviews might make the study less objective (Elo et al., 2014). To address this issue, the study employs manual sentiment analysis to produce objective, quantifiable estimates of the sentiment represented in the interview transcripts utilising techniques such as the ones presented by Saldaña (2009). The aim is to acquire a more thorough and nuanced grasp of the topic by using this analysis to discover patterns and trends in the data (Joffe et al., 1996; Polkinghorne, 1995). The proposed implementation of sentiment analysis involves systematically analysing the different topics or concepts from the interviews.

Using a Likert scale for assessing participants' perceptions also provides a standardised measure for comparison. Accordingly, the approach assesses the degree of agreement or disagreement from 1 (strongly disagree) to 5 (strongly agree) associated with each identified concept. The approach used to assess these levels follows an intuitive method while maintaining analytical precision, following indications provided by Joffe et al. (1996) for relevant statement identification and contextual analysis and literature by Polkinghorne (1995) to aid the utilised overall approach of applying an intuitive understanding of narrative to derive insights.

Firstly, the analysis commences with identifying pertinent statements within the discussion transcripts. These statements are then catalogued within a table, and a broader quote is included to provide context and ensure comprehensive understanding. Subsequently, the highlighted portions are correlated with the appropriate conceptual label.

Secondly, sentiment analysis is carried out by perusing the highlighted statements and assessing the sentiment. This stage might require a sufficient or advanced level of English understanding, as all interviews were in English. Accordingly, identifying whether the speaker's sentiment was positive, neutral or negative shall be possible. The intensity of sentiment is subsequently assessed by differentiating between strong and weak agreement or disagreement. It can be argued that such evaluation may be rooted in the researcher's subjective linguistic intuition and understanding. Nevertheless, the endeavour to sustain rigorous objectivity during this evaluation was pursued with fervent diligence and steadfast dedication.

Lastly, a final contextual analysis is performed, wherein the topic and the interviewee's viewpoint are considered. Based on this comprehensive review, an agreement score is assigned. It is important to note that, while subjectivity is inherently present due to the qualitative nature of this analysis, multiple validation processes such as cross-referencing, peer review and maintaining a reflective research journal were implemented to maintain and ensure the reliability and validity of the findings.

In some perceptions, some participants did not explicitly mention the identified themes; therefore, a N/A value was attributed to these individuals, as it indicated neutrality and did not influence the data. The identified themes from the interviews are aligned with the theoretical framework, supporting the study's validity. The analysis in this context may provide empirical evidence on the perceived impact of cGAI on the various aspects of the creative process identified in the literature review. The results of this study undergo a cross-validation process, wherein the gathered information from the interviews is compared to the insights present in current literature about the topic and patterns within the data shall resonate with the literature's theories.

4.4.5. Reporting and Interpretation

The accumulated findings are integrated and articulated in a comprehensive exposition of the results, elucidating their significance and pertinence in connection to the research questions and propositions. A re-evaluation of the contribution to the existing body of research is undertaken, with the aspiration of uncovering novel insights that may foster innovative ideas and inform recommendations for future research or practice.

Throughout the discussions with experts and regular users of cGAI technology, new perspectives on the interrelations of what comprises the creative process were made. Intriguingly, not all individuals perceive the same advantages of employing cGAI within the specific contextual scenarios presented or in their personal experiences. Indeed, each participant distinctly employs the conversational tool, even though they may share common objectives or engage in similar use cases to reduce the workload of repetitive tasks. Subsequent sections shall provide the corresponding case reports elucidating these findings.

4.4.6. Data Saturation

The concept of data saturation is integral to qualitative analysis methodologies, including those employed in the analysis of interviews. Dedicating attention to data saturation is crucial to ensure an adequate number of interviews have been conducted, such that each additional interview contributes minimally to the emergence of new insights. However, this delineates certain limitations regarding the overall volume of information that can be harnessed to address the research question posited by this study. The employed approach to data saturation follows the method proposed by Guest et al. (2020), which posits that if the incremental interview contributes less than 5% additional content, data saturation can be considered significantly attained. Within the confines of this thesis, data saturation was assessed through the following mechanism: In the initial phase of the study, up to 10 sub-themes were discerned from the first analysed interview, with a considerable emergence of up to 2 new sub-themes of the subsequently analysed ones. However, following the analysis of the sixth interview, no further novel sub-themes were detected, given that the topics discussed in the subsequent interviews were already encapsulated within the pre-existing sub-themes. Thus, it can be concluded that data saturation was attained, implying that an adequate number of interviews were conducted for this study.

5. Data Analysis and Results

5.1. Case Report: Scholarly Domains

5.1.1. Case Background

The case focusing on the scholarly domain comprises five distinct sub-cases representing various academic backgrounds and fields. These highlight the interdisciplinary nature of research participants, who share expertise in the use and implications of cGAI. Consequently, this research endeavours to depict perceptions of the academic sphere by contrasting findings with those from the economic sector. The aim is to unveil nuanced differences, commonalities, and transformative insights that can develop a better understanding of this study's investigation.

Furthermore, these cases include individuals who have made significant contributions to AI social impact research, explored the creative sector, and conducted analyses on the influence of AI technology in the arts, among other noteworthy endeavours. It is assumed that researchers in this domain will most likely implement and experiment with cutting-edge technologies, such as cGAI. Their exposure to the use and potential of cGAI offers rich insights grounded in comprehensive experience and advanced understanding; having some participants whose journey with cGAI predates the release of chatGPT gives them a deep and historical perspective on the technology's evolution. Their views are essential to understanding this study's research objective, and compelling use cases / advantages of cGAI in academic and research communities

can be leveraged through an objective interpretative analysis of such views. In the following, to present each sub-case, they will be referred to as Participant ID_1, Participant ID_2, ..., to ensure anonymity and a structured presentation of results.

Participant ID_1, a 32-year-old Research Associate in the Philosophy Department at a German university, holds a PhD in Philosophy/Music from the UK and an MA/BA in Philosophy from Italy. With a professional background encompassing Philosophy, AI, and Creativity, ID_1 brings diverse expertise to their engagement with cGAI.

Participant ID_2, 27 years old, possesses a diverse professional background, including experience in teaching, an AI start-up internship, and co-founding endeavours. With an academic background in Automation Engineering and Data Science from Italy and Germany, ID_2 has acquired a strong foundation. Their expertise lies within AI and Machine Learning, reflecting a deep understanding of these areas. ID_2 has played a significant role as a large language model developer and implementor, indicating their involvement in the practical application of cutting-edge language models.

Participant ID_3, a 26-year-old researcher, brings a unique blend of professional and academic backgrounds to the study. With experience in the labour rights garment industry in Asia and a current pursuit of a PhD in Political Science and Sustainable Development, ID_3 possesses a deep understanding of the non-profit research, healthcare, pharmaceutical, and technology sectors. Furthermore, ID_3 has engaged with cGAI through involvement in AI social impact research, creative sector exploration, AI in arts, and as a technology impact analyst. This combination of experiences equips ID_3 with valuable insights into the potential impact and applications of cGAI within various industries.

Participant ID_4, a 30-year-old professional actor and philosophy researcher, offers a distinctive perspective rooted in their diverse academic background. With a master's degree in chemistry, training from a drama school, and a foundation in philosophy, ID_4 possesses a multidisciplinary skill set. Their industry involvement spans the realms of theatre, education, and writing. ID_4 has played a role as a generative AI implementor within the drama industry.

Participant ID_5 is a 33-year-old professional with experience in financial consultancy, banking, and education. Their academic background includes a bachelor's degree in economics and business, a Master's degree in International Management from a Dutch university, and expertise in economics, business, international management, and education. ID_5's engagement with cGAI encompasses participation in chatGPT workshops, implementation of generative AI within the education sector, and an innovative approach to education as an education innovator. This diverse range of experiences allows ID_5 to provide valuable insights into integrating cGAI in educational contexts and its potential implications for economics and business.

5.1.2. Divergent Thinking

In the Creative Problem Solving (CPS) model, *divergent thinking* is utilised to endorse various possible solutions, encouraging individuals to expand their horizon of thought to resolve complex problems (Osborn, 1963). This research, employing CPS as a basis, explores how cGAI can potentially enhance this human cognition in the creative process. Following the previously mentioned method, perceptions were assessed on a scale of 1 to 5 to assess the level of agreement for each subcategory and conceptual label. Here, a higher value signifies higher agreement or affirmation from the interviewee's perspective. The following perceptions will be presented in a summarised manner for each Participant, starting with Participant ID_1.

Through their involvement in AI Social Impact Research, Creative Sector Exploration, AI in Arts, and as a Technology Impact Analyst, ID_1 has acquired extensive experience with cGAI. During the interview, several insightful perspectives were revealed. ID_1 recognises the value of the AI's expansive knowledge and uses it to brainstorm original solutions, as quoted here: "They might use the system to brainstorm, probably on more original solutions". The AI's unique perspectives and systematic approach to ideation are appreciated, viewing it as a source of intellectual stimulation and a creator of innovative ideas. Given the participant's experience in researching the field of cGAI and creativity, explicit statements about the dynamics of human creativity involving divergent and convergent thinking have been mentioned, providing further nuanced insights that echo the principles advanced by Goldschmidt (2016) highlighting and outlining the dynamics of human creativity. ID_1 also acknowledges the AI's ability to identify unseen issues, bridge disciplines, discern patterns, and creatively combine elements. These insights highlight the significant role that cGAI plays in ID_1's academic and research pursuits within Philosophy, AI, and Creativity.

Participant ID_2 holds diverse perceptions that using cGAI improves *divergent thinking*. While expressing appreciation for the ability of chatGPT to generate unconventional or "nonsense" ideas as part of brainstorming processes, ID_2 maintains a level of scepticism about the effectiveness of generative AI tools like chatGPT in certain areas, such as coding, attributing it to personal preference. However, ID_2 finds chatGPT helpful in generating ideas, particularly for text generation, but exercises caution against overreliance on the tool. Additionally, ID_2 acknowledges the utility of chatGPT in generating novel use cases for AI in various industries, as shown in the following quote from the discussion: "For example, I used it. I used it a lot for use case generation, and a few weeks ago, because they wanted to build a slide deck with a lot of use cases for AI for different industries, and I use the chatGPT I mean generates this use case so it can be very, very effective for that." There is also some scepticism regarding the application of chatGPT for interdisciplinary thinking, although the tool's potential usefulness for generating ideas is recognised. Moreover, ID_2 acknowledges the extensive use of chatGPT by others in the office, which may imply a neutral perception of their ability to leverage the tool. Overall, ID_2 positively views chatGPT's capacity for text generation and frequently utilises it for creating slides, proposals, and emails. While maintaining a level of scepticism, ID_2's perceptions suggest that using cGAI can enhance *divergent thinking* by generating a

broader range of ideas. However, caution should be exercised to avoid overreliance and critically assess the generated concepts.

Participant ID_3 strongly endorses using cGAI for *divergent thinking*, appreciating its utility in facilitating multidisciplinary discourse and expediting the ideation process. Despite recognising cGAI's ability to generate novel ideas and use cases, they advocate for human intervention to refine outputs and promote original solutions. While cGAI is a useful tool for interdisciplinary thinking and combinatorial creativity, ID_3 highlights potential limitations in pattern recognition and urges users to direct and elaborate cGAI responses. They also express concerns about the lack of source credibility in cGAI's outputs, suggesting it may affect decision-making. Despite these reservations, ID_3 acknowledges the significant time-saving potential of cGAI, though they caution against immediate gratification hindering the exploration of unconventional perspectives. In conclusion, while ID_3 appreciates the role of cGAI in enhancing *divergent thinking*, they stress the importance of human engagement in harnessing its full potential.

Participant ID_4 holds a diverse perspective that using cGAI can improve *divergent thinking*. While they acknowledge AI's ability to contribute to various disciplines, speed up ideation processes, and foster new connections, they also express reservations about the authenticity and novelty of AI-generated ideas. They appreciate AI's role in brainstorming and ideation, highlighting its potential to create unexpected associations. Such perception became clear when analysing the quote: “[...] it brings in things that you had not even realised could be connected to what you are [...] dealing with at the moment.” Given the participant's expertise background, the discussion highlighted the use of this facet of AI in the creative art industry, more specifically, the theatre industry. Such aspect is coherent with research by Hughes et al. (2021), Mazzone, M. (2019) and Roose, S. (2022), which state that current technological advances allow the incorporation of GAI models into various creative practices within art industries. Additionally, findings by Baas M et al. (2015) can be identified in ID_4's perceptions, as the importance of human creativity's adaptability in changing demands was perceived. However, doubts are voiced about the relevance and meaningfulness of AI-generated content, emphasising the need to evaluate AI's outputs critically. This scepticism extends to AI's ability to generate novel solutions and use cases, despite recognising its pattern recognition and combinatorial creativity skills. In essence, ID_4 sees potential in cGAI for enhancing *divergent thinking* but underscores the importance of human scrutiny of AI's outputs for effective utilisation.

Participant ID_5 holds a favourable view towards the proposition that using cGAI improves *divergent thinking*. They perceive cGAI as a tool for promoting cross-disciplinary knowledge and collaboration and a valuable asset in brainstorming sessions due to its ability to synthesise and generate ideas. ID_5 appreciates the capacity of cGAI to present unique solutions and facilitate the ideation process, believing it can help overcome stagnation in creative thinking. They view AI as a source of novelty and ideas, capable of offering fresh insights and scenarios. Moreover, they recognise the potential role of AI in oversight as an impartial observer and believe it can contribute to interdisciplinary understanding. They consider combining human creativity and AI beneficial, particularly in crafting stories. They see AI as an effective tool for generating

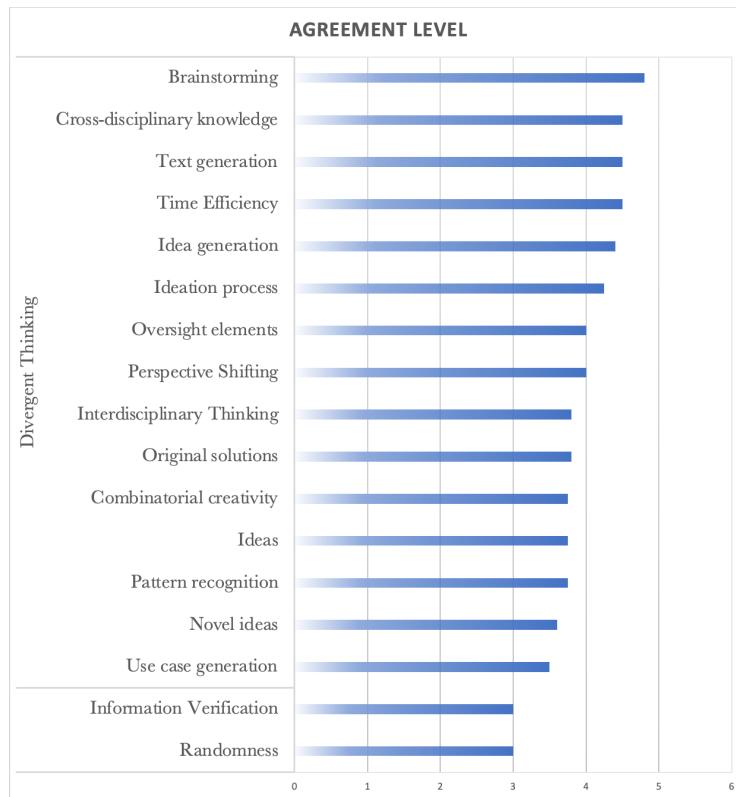
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text, creating practical use cases, and gaining new perspectives, demonstrating a substantial recognition of cGAI's role in enhancing *divergent thinking*.

Figure 5 presents a schematic representation of the discourse, illustrating the agreement levels for each of the 85 conceptual labels (derived from 5 distinct labels per each of the 17 subthemes). This visualisation is a quantitative measure of the perceptions associated with these subthemes and their respective labels, providing a comprehensive overview of the consensus on the topics under discussion.

Figure 5 – Agreement level on *divergent thinking* - oriented identified subthemes



Brainstorming stands out with an average agreement level of 4.8, affirming cGAI's significant role in facilitating brainstorming sessions. Idea generation, cross-disciplinary knowledge, and text generation also receive high scores (4.4, 4.5, and 4.5, respectively), confirming cGAI's capability to stimulate diverse ideas and generate coherent text. Meanwhile, aspects like the ideation process and oversight elements receive a moderate rating of 4.5 and 4, respectively, reflecting general confidence in cGAI's abilities in these areas. Other aspects, such as original solutions, interdisciplinary thinking, and pattern recognition, have agreement levels ranging from 3.8 to 3.75, suggesting a positive yet mixed perception. Perspective shifting and use case generation are moderately perceived, while information verification and randomness reflect some

ambivalence with a rating of 3. These insights provide a comprehensive understanding of cGAI's perceived capabilities in various aspects of creativity and problem-solving.

5.1.3. Context Awareness

In the Creative Problem Solving (CPS) model, *context awareness* is fundamental to recognising and clarifying problems, promoting a comprehensive understanding of the issue (Osborn, 1963). *Context awareness* is understanding and incorporating relevant situational information in decision-making. Embedding this within the creative process can direct the ideation towards more targeted and effective solutions. Adopting the earlier mentioned method, perceptions were analysed and interpreted as follows.

ID_1 holds positive perceptions of the potential of cGAI in enhancing *context awareness*. The participant views AI's summarisation capability as advantageous for managing and tracking requirements, indicating a beneficial role in dealing with intricate project details. The concept of a receptive interface also receives a positive acknowledgement, with AI deemed proficient at handling diverse client inputs efficiently. This signifies the adaptability of AI to specific contexts based on different user requirements. Moreover, ID_1 appreciates the task distribution capability of AI, especially for delegating mundane tasks, which can streamline workflows and allow greater focus on creative endeavours. The enhanced memory feature of AI, particularly following chatGPT's memory extension, is also seen as a valuable asset, enabling better recall and application of information. ID_1 also regards AI as a tool for performance assessment and creative evaluation, recognising the self-evaluative mechanisms in GANs and valuing real-time feedback mechanisms. Lastly, ID_1 emphasised the cGAI's ability to delegate mundane tasks in the following quote: "So again using it as a purely the delegating, the most boring part of the process". These insights reflect ID_1's positive appraisal of cGAI's ability to provide relevant information and suggest improving *context awareness*.

As for Participant ID_2, doubt was expressed over the capability of GPT models like GPT-3.5 and GPT-4 to effectively store and recall past tokens, terming their memory capacity as "limited and unreliable for important requirements". This scepticism extended to the models' understanding, where the participant dismissed their active listening capabilities as inferior to human abilities. Despite recognising chatGPT's potential for task delegation, like generating images and text, they highlighted the challenge of prompt engineering, a crucial aspect for grasping the full potential of cGAI. This aspect aligns with the main findings by Amer (2923), explaining the importance of well-designed prompts for getting the most out of AI agents. Further, they expressed that interaction with chatGPT could be time-consuming, implying an inefficiency in maintaining focus. The participant attributed this to chatGPT's limited capacity for contextual memory, seen as a byproduct rather than an intended feature. Finally, although they acknowledged GPT's potential in idea generation, they expressed doubts about its reliability and utility, particularly citing issues with its responsiveness. Overall, these perceptions cast a critical light on the efficacy of cGAI in promoting *context awareness*.

Mixed sentiments are expressed in analysing participant ID_3's perceptions of proposition number 2. On the positive side, they acknowledge AI's prowess in idea generation and summarisation ability, describing how it can effectively summarise large information chunks and generate relevant prompts. However, they underscore several limitations. They criticise AI's function forgetting and memory limitations, pointing out AI's tendency to forget set instructions or prior agreements as shown in the quote: "at one point, it forgets that we made that agreement early in the conversation.". They also perceive that the AI must truly understand a conversation's direction. Moreover, while acknowledging AI's generation capabilities, they stress the need for human intervention to evaluate the output. In sum, this participant perceives that while cGAI can improve *context awareness*, it has significant limitations.

Next, participant ID_4 acknowledges the AI's overarching awareness, indicating its ability to remember previous interactions while noting its limits. The participant also discusses the AI's active listening, although expressing some dissatisfaction with its coherence and relevance. The capacity for automated delegation is acknowledged, particularly when storing specific successful models. However, the participant perceives the AI's aid in focus and contextual memory as limited, also suggesting that human intervention is needed. Scepticism extends to AI's ability to evaluate the coherence and consistency of an essay. The AI's role in aiding creativity is recognised but seen as constrained. Overall, this participant sees cGAI as a valuable tool for enhancing *context awareness* but also emphasises its limitations and the continued necessity for human oversight and direction.

Lastly, participant ID_5 demonstrated high confidence in cGAI's potential to enhance *context awareness*. They perceived AI's ability to provide a holistic task overview and its utility in streamlining workflows. These perceptions reflect the belief that cGAI can play a significant role in organising and managing tasks efficiently. The participant also identified AI as a valuable tool for maintaining focus, suggesting that it helps stay real-time with endeavours. This perception was complemented by a high regard for AI's contextual memory, appreciating its ability to remember context over time, thus aiding the continuation of tasks after breaks. A significant perception involved the utilisation of AI as a creative assistant, demonstrating its capacity to aid in the creative process. The participant also appreciated AI's role in task organisation and streamlining creative workflows, emphasising its benefits in simplifying complex workflows. Participant ID_5 strongly believed in the AI's capacity to enhance *context awareness* in creative problem-solving processes.

Continuing the illustrative approach in the prior sections, Figure 6 below provides a graphical representation of the consensus levels associated with the identified conceptual labels.

Figure 6 – Agreement level on context awareness - oriented identified subthemes

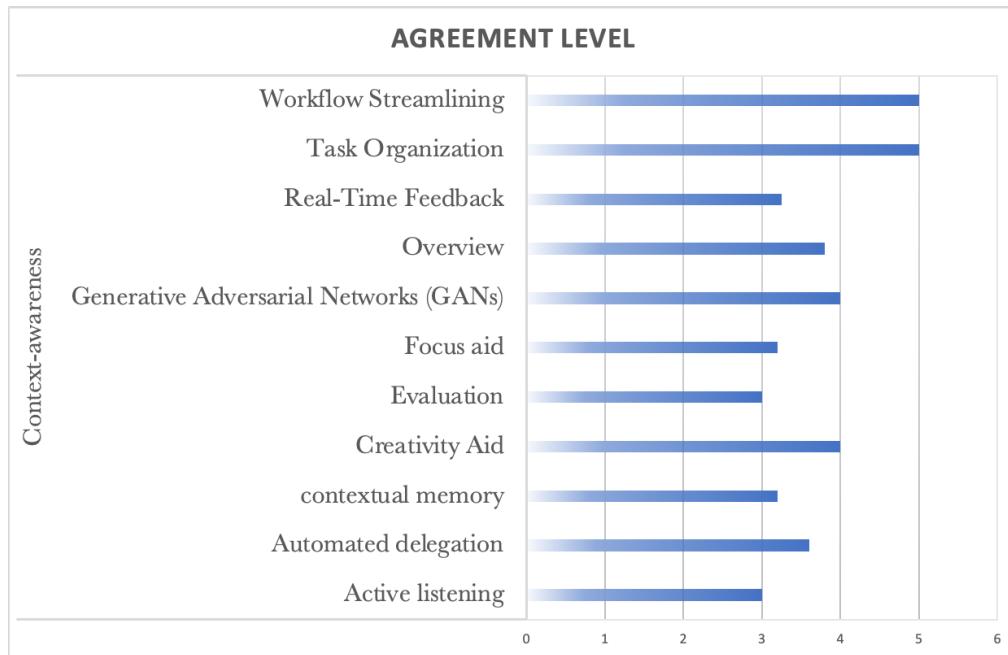


Figure 6 reveals an interesting distribution of perceptions regarding *context awareness*. The highest agreement, with an average score of 5, is found within “Task Organization” and “Workflow Streamlining,” indicating respondents’ recognition of cGAI’s ability to provide a comprehensive and succinct understanding of the given context. “Creativity Aid” and “Automated Delegation” follow closely, with average scores of 4 and 3.6, underlining the appreciation of cGAI’s role in facilitating creativity and task management. As we move towards the lower end, “Real-Time Feedback,” “Focus Aid,” and “Contextual Memory” emerge with scores of 3.25 and 3.2, respectively, suggesting respondents’ scepticism towards cGAI’s reliability in providing instant responses, aiding focus, and remembering context. The lowest agreement is on concepts such as “Active Listening” and “Evaluation,” with average scores of 3. These categories reflect respondents’ perceptions about cGAI’s input on context enhancement, clearly indicating areas that require further development.

5.1.4. Real-time Support and Feedback

In the Geneptore model of creative cognition proposed by Finke, Ward, and Smith (1992), two crucial phases of creativity are identified: Generative and Exploratory. This framework underscores the cognitive mechanisms employed in brainstorming and evaluating creative concepts. It highlights the iterative nature of creativity, manifesting as a continual cycle between generating and refining ideas before arriving at the final creative product (Ward et al., 2013; Finke et al., 1996). This case study refers to these facets of the creative process as “real-time support and feedback”, acknowledging creative components’ periodic evaluation and refinement of creative components. The Geneptore model and the Generative Adversarial

Networks (GANs) nature encapsulate this cyclic creativity, with the former emphasising the relationship between generative and exploratory stages and the latter showcasing the competitive interaction between generator and discriminator networks. *Real-time support and feedback* related to Proposition 3. Although, it correlates with Proposition 2, as *context awareness* has been shown to influence *real-time support and feedback* significantly. In the following, participants' related perceptions are outlined.

For participant ID_1, perceptions are generally positive, with some suspicion regarding accuracy. The participant strongly believed in AI's potential to streamline tasks and workflows, viewing AI as a significant contributor to productivity enhancement and work efficiency. The appreciative sentiment for the AI's ability to provide tailored assistance and adapt communication style indicates the participant's expectation for AI to cater to individual user needs. Furthermore, the participant also valued the AI's ability to provide self-evaluative tools, continuous learning, and collaborative problem-solving, thus acknowledging the dynamic and iterative feedback process involved in the AI's learning journey. However, the participant's view was not without a more realistic perspective. A key concern highlighted was the AI's tendency towards false affirmation, agreeing with user statements even when they are incorrect. This is made more clear by the evident quote here: "But what a chatGPT tends to do is always to say that you are right even when you are not..." This underlines the desire for more critical and constructive feedback, pointing out user errors and providing accurate information. Therefore, while participant ID_1 recognises the benefits of AI in terms of productivity, efficiency, and personalised responses, there are clear apprehensions regarding the AI's current feedback accuracy and constructive critique capabilities.

Participant ID_2 appreciated AI's efficiency for simpler tasks and its potential to provide personalised responses and challenge reasoning, reflecting positive perceptions of AI's real-time feedback. However, this participant harboured scepticism about AI's abilities in complex tasks, with trust issues surrounding AI's responses and the reliability of the provided information. These perceptions highlight the participant's recognition of AI's utility in enhancing efficiency for simpler tasks while exposing concerns over the accuracy and reliability of AI's real-time feedback in more sophisticated tasks.

Participant ID_3 discerned chatGPT as a useful tool for well-defined tasks, contributing to task efficiency and serving as a beneficial addition to their workflow rather than replacing human interaction. They acknowledged the platform's potential for facilitating reflection and providing feedback, notwithstanding such engagement was contingent upon the user's input. The participant expressed that the quality of real-time feedback was largely influenced by how the user prompted chatGPT. Despite appreciating the system's practicality, they expressed limitations concerning the emotional connection. They perceived chatGPT as a reactive tool, lacking the proactiveness of a human colleague, which was perceived as crucial for effective support and feedback. They were also sceptical about chatGPT's speed and noted the possible bias in feedback based on user prompts.

Participant ID_4 sees chatGPT as a potential aid for improving time efficiency, valuing its capability to speed up tasks. Nevertheless, the participant highlights the AI's lack of specificity and the absence of a

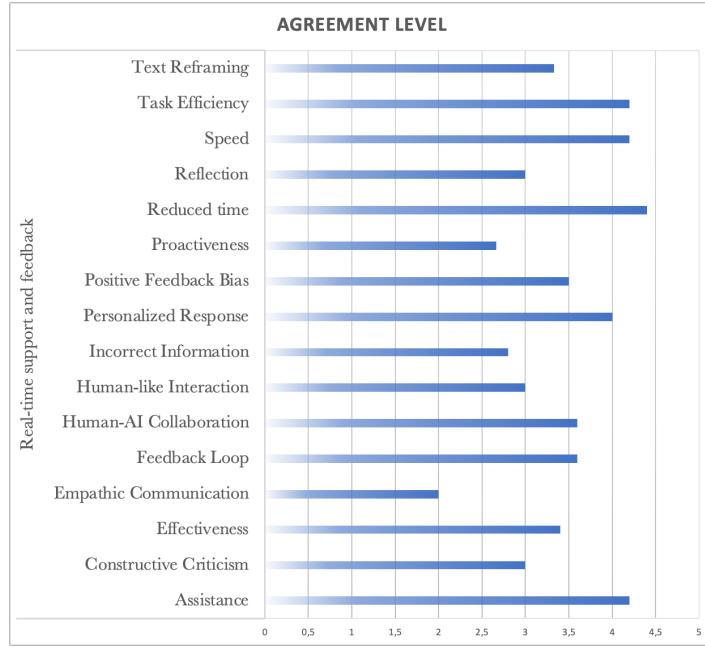
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human element, especially in high-stress situations. Concerns are also expressed about chatGPT's ability to provide authentic feedback and accurate interpretations. The participant underlines the trade-off between time efficiency and the interpersonal aspect, observing that while chatGPT can improve task efficiency, it lacks the emotional intelligence and personal connection a human colleague offers. They also question chatGPT's ability to provide accurate and constructive feedback due to perceived training biases and a lack of emotional understanding. Despite recognising AI collaboration's benefits, the participant longs for human connection.

Participant ID_5 finds the AI a valuable tool, attributing high levels of efficiency to its ability to provide quick responses and continual feedback. They view the AI as a supportive tool in their teaching role, noting its helpfulness and even superiority over themselves at feedback, with a focus on objectiveness. The AI's capacity to allow participants to reflect on their feedback style and provide personalised responses enhances their teaching practice. Subsequently, it is found that the cGAI is limited in mimicking empathy but appreciates its attempts to mimic human interaction. They perceive AI as a tool capable of effective constructive criticism, valuing its proactive nature and ability to reframe responses. The cGAI's possibility to provide incorrect information and its potential bias in providing positive feedback is acknowledged but not emphasised as significant issues. The participant's perceptions underline a belief in the benefits of human-AI collaboration. They see AI as an effective and efficient tool in *real-time support and feedback*, acknowledging its potential for future growth.

Figure 7 – Agreement level on *real-time support and feedback* - oriented identified subthemes



The highest agreement (4.4/5) pertains to “Reduced time”, indicating appreciation for AI’s efficiency and productivity. “Assistance”, “Task Efficiency”, and “Speed” follow, scoring 4.2, emphasising AI’s supportive role and quick turnaround. There is somewhat lesser agreement on “Personalized Response” and “Feedback Loop”, scoring 4 and 3.6, respectively, suggesting varied perceptions of AI’s tailored assistance and continuous learning capabilities. “Human-AI Collaboration” and “Effectiveness” score 3.6 and 3.4, respectively, indicating some reservations about AI’s collaboration and overall effectiveness. The lowest agreement occurs in “Text Reframing”, “Reflection”, “Constructive Criticism”, “Human-like Interaction”, “Proactiveness”, “Incorrect Information”, “Positive Feedback Bias”, and “Empathic Communication”, scoring 3.33, 3, 3, 3, 2.67, 2.8, 3.5, and 2 respectively, highlighting doubts about AI’s capacity to rephrase, foster self-reflection, provide constructive feedback, mimic human interaction, initiate action, maintain accuracy, avoid bias, and demonstrate empathy. Lastly, it is important to note that the agreement levels for the constructs "Positive Feedback Bias" and "Incorrect Information" have been inversely adjusted. This ensures a more standardised measurement of what enhances *real-time support and feedback*, ultimately facilitating interpretations within the established theoretical framework.

5.1.5. Case Summary and Conclusions

This case report explores the perspectives of five participants from diverse academic backgrounds regarding the use and implications of cGAI, aiming to envision its impact within scholarly domains. The participants range from researchers in philosophy and AI to practitioners implementing AI within education and theatre, all contributing to a rich dialogue on cGAI’s role in these fields. The gathered varied perspectives

help to construct a more nuanced understanding of the implications of cGAI within scholarly domains, recognising both its potential and the need for human oversight and intervention.

Regarding *divergent thinking*, brainstorming stood out with a high agreement level of 4.8, and the ability of cGAI to facilitate idea generation, cross-disciplinary knowledge, and text generation was also rated highly. However, original solutions, interdisciplinary thinking, and pattern recognition received slightly lower agreement levels, indicating mixed perceptions. Other areas like perspective shifting, use case generation, information verification, and randomness showed some ambivalence, pointing towards the need for improvement. When considering *context awareness*, participant views varied significantly. The report found that cGAI can enhance *context awareness*, and participants acknowledged its abilities to manage complex project details, adapt to diverse client inputs, delegate tasks, and recall and apply information. However, some expressed doubts about the ability of cGAI models, such as GPT-3.5 and GPT-4, to store and recall past interactions effectively. The highest agreement, with an average score of 5, is found within “Task Organization” and “Workflow Streamlining.” This result indicates respondents’ recognition of cGAI’s ability to provide a comprehensive and succinct understanding of the given context. The lowest agreement is on concepts such as “Active Listening” and “Evaluation,” with average scores of 3. These categories reflect respondents’ perceptions about cGAI’s ability to enhance context, clearly indicating areas that require further development. As for *real-time support and feedback*, the highest agreement related to “Reduced time” (4.4/5), showing that participants appreciated cGAI’s ability to improve efficiency and productivity. “Text Reframing”, “Reflection”, “Constructive Criticism”, “Human-like Interaction”, “Proactiveness”, “Incorrect Information”, “Positive Feedback Bias”, and “Empathic Communication” had the lowest agreement, scoring 3.33, 3, 3, 3, 2.67, 2.8, 3.5, and 2 respectively, highlighting concerns about the AI’s ability to rephrase text, promote reflection, offer constructive criticism, mimic human interactions, initiate actions, maintain accurate information, avoid bias, and exhibit empathetic communication. Scores for “Positive Feedback Bias” and “Incorrect Information” were inversely adjusted, standardising the measurements and facilitating better interpretation within the established theoretical framework. This data thus suggests that while participants acknowledge the benefits of real-time support and feedback, there is a need for further improvement in certain areas to enhance the effectiveness of human-AI collaboration.

Overall, the report paints a nuanced picture of the perceived role of cGAI in creative problem-solving, with high recognition of its potential in some areas but reservations and scepticism in others.

5.2. Case Report: Economic Sector

5.2.1. Case Background

This report pivots to exploring the use of cGAI in the technology-intensive industry. As the present industry exhibits an accelerating trajectory towards innovation, catalysed by heightened knowledge, technical insight, and managerial capabilities (Camisón-Haba et al., 2019), the implications of AI and cGAI are deemed

consequential for its future course. Following Amabile et al. (1996), this study argues that creativity - the "seed of innovation" - can be catalysed through cGAI, which motivates this investigation. Moreover, we focus on organisations that actively engage with avant-garde technologies as they foster an ecosystem integrating AI, including cGAI. This report involves enterprise participants with a strong technology focus in Data Science and AI, besides cross-disciplinary departments. In their roles within this tech-intensive landscape, participants ID_6 to ID_10 present insights on the three propositions, and the following discourse scrutinises these perspectives and their implications, considering participants' optimism, scepticism, and conditional approvals about the proposed cGAI's potential. While this examination unveils a spectrum of views, it aims to sketch a nuanced understanding of how the technology is adopted and perceived within the technology-intensive industry on a creative process level, ultimately contributing to the discourse on AI's role in future innovation and creative progress. The following brief overview of each participant to provide context on the gathered insights.

Participant ID_6, who is in their late 20s, has a varied professional background, with experience in start-up marketing, freelance development, and entrepreneurship, having founded four start-ups. They studied Economics and Business (BSc) at the University of Amsterdam and currently operate as developers and System Integrators, focusing on Machine Learning Solutions. They are a daily user of chatGPT, highlighting a consistent interaction with cGAI.

Participant ID_7, in their mid-40s, is a company founder with a background in Engineering, even though they did not complete the degree. With over two decades in IT services, including experience in wireless fundraising for start-ups and analytics, their industry expertise is broad and substantial. Their engagement with cGAI is deep-rooted, involving solution development and AI tools for Data Analytics and Forecasting.

Participant ID_8, in their early 40s, currently holds a directorial position at a design firm and has previously worked as a UX Researcher and Strategist at Google. They hold a Marketing MSc from one of the largest higher education institutions in the UK and a Strategy and Innovation MA from the University of Oxford. Their professional expertise includes applied research, tech integration, data analytics, and strategy, with a key cGAI experience being their position as Generative AI Strategy and UX at Google.

Participant ID_9, in their early 30s, is a data scientist and behavioural scientist. They have also served as a consultant in data engineering and teaching roles. Their academic background includes a BSc and MSc in Psychology from Groningen, Netherlands. They work primarily in applied research and tech integration. Their experience with cGAI encompasses workshops, prompt engineering workshops, and the implementation of large language models.

Lastly, participant ID_10, in their mid-20s, is an innovation strategist with an eclectic background in data analytics, tech community engagement, and entrepreneurship. They hold a BSc in International Business focusing on Developmental Economics and a Master's in Business Information Management. Their

diverse industry footprint spans academia, tech, education, and food system transitioning. Their cGAI experience comes from their membership in a Data Analytics Research Centre.

5.2.2. Divergent Thinking

This chapter delves into the role of cGAI in fostering *divergent thinking* within the tech-intensive economic sector. Building upon prior exploration of the CPS model, we contextualise these cognitive processes within a rapidly evolving, technology-driven landscape (Osborn, 1963). We probe into perceptions from diverse participants who inhabit this space, including tech entrepreneurs, AI developers, and data scientists. Accordingly, this chapter explores the diverse perceptions of participants in the Economic Sector.

ID_6 expressed strong agreement with Proposition 1. They appreciated the vast knowledge base of chatGPT, regarding it as a reliable source that transcends specific fields, providing diverse perspectives for idea generation. They acknowledged the AI's utility in brainstorming sessions and problem-solving, finding it valuable in ideation. Even though they noted its tendency towards over-compliance, they still saw it as capable of offering unique solutions. ID_6 perceived a boost in productivity using chatGPT as an innovation that fundamentally changes the ideation process. They found its ability to connect interdisciplinary knowledge, identify patterns, and apply its broad knowledge for solutions as beneficial to the point of attributing chatGPT to "the boss", as shown in the quote: " [...] Ask the boss, and then we go and ask chatGPT. Turns out that it knows pretty well how to handle situations where we have no clue what to do...". Despite this, they advised caution due to its tendency to agree with user inputs. Overall, ID_6 showed confidence in chatGPT's potential to improve *divergent thinking*.

ID_7 recognised the role of chatGPT in aggregating diverse knowledge and opinions and generating fresh ideas during brainstorming sessions. While acknowledging cGAI's value in original problem-solving, they emphasised the irreplaceable human understanding of the target market. cGAI was seen as a significant aid in ideation, contributing to creativity and idea validation. In their daily work scenarios, practical uses for chatGPT were information validation and text generation. They appreciated chatGPT's ability to generate concise, detailed text, enhancing efficiency and saving time, as shown in his intervention: "And then we are like, okay, chatGPT: Make it in a super concise bullet point list of the top 3 most important thing about this thing [...] Okay, let us use chatGPT, [...] and ask "What are the consequences of doing this and boom!". They also found value in AI as a tool for collaborative brainstorming, information validation, and generating unexpected ideas. However, while they recognised the potential of AI to provide diverse perspectives, they also underlined the need for a "consumer" version of chatGPT to create practical scenarios.

ID_8 perceives cGAI as a facilitator of *divergent thinking*. Seeing the need for integration across disciplines, they believe it can unlock creativity, generate novel ideas, and provide new insights, enhancing problem-solving and ideation processes. They see potential in chatGPT contributing thoughts, as a novel input, to discussions and brainstorming sessions. They also envisage chatGPT overseeing workflows and streamlining processes while providing interdisciplinary thinking and data processing capabilities, offering

hints in a direction that is coherent with prior literature by Hughes et al. (2021). Given the professional background of participant ID_8, findings by Gruetzmacher, R. (2022) are equally found in this thesis' findings, as the Generative AI language model is indeed assisting strategic tasks within scenario-planning in organisations, considering also that ID_8 works at a designated, Generative AI - specific Strategy position at Google. Accordingly, the following quotes under the conceptual label "Oversight Elements" and "Interdisciplinary Thinking", respectively, are selected to provide further evidence of the portrayed perceptions: "Or eventually you could have maybe the thing doing both, which means the AI tool automatically takes care of your meetings and your notes and your transcripts from those conversations" – "I think this is where it becomes interesting. I do not think they should try to think about the ideas as equal or try to get solutions, but more like, hey, we are stuck with this thing. We need whatever this obstacle is that we have."

The interviewee values its potential for combinatorial creativity and imagines its future evolution in various applications, appreciating its current capacity for text generation. Although they did not explicitly discuss information verification, there is an implicit understanding that chatGPT can be a reliable information source. They acknowledge that chatGPT could expand viewpoints on a problem, offering different perspectives and stimulating creativity.

ID_9's perceptions underline cGAI as a beneficial adjunct to *divergent thinking*. They appreciate the tool's ability to synthesise cross-disciplinary knowledge, effectively generating novel inputs and providing unique insights. This capacity also assists in personal brainstorming sessions and furnishes users with prompted ideas. However, they acknowledge the need for effort to integrate chatGPT into creative processes. chatGPT is perceived as a neutral sounding board, offering novel interpretations of problems and acting as a neutral facilitator for perspective shifts. They also value its ability to guide creativity, combining diverse knowledge domains and synthesising various elements. They propose a learning curve for its effective utilisation and appreciate how it supports the creative process, particularly in dialogue generation. Acknowledging the expanded context memory in newer models and personal comfort affecting tool effectiveness, ID_9 highlights the potential limitations and strengths of chatGPT as a creative aid.

ID_10 perceives cGAI as a valuable resource in facilitating *divergent thinking*, offering diverse insights from multiple disciplines, and enhancing the ideation process. They underscore the potential of chatGPT in cross-knowledge transfer, noting its ability to present ideas and practices unknown to specific regions or industries. Recognising its role in aided brainstorming, they caution against overreliance on the tool, stressing the importance of human participation. ID_10 appreciates the AI's contribution to idea generation, highlighting its efficiency in rapid ideation and its capability to suggest novel insights and tech-assisted solutions while encouraging critical evaluation of these inputs. They value chatGPT's ability to provide a broader perspective, often resembling a helicopter view of complex situations, and its interdisciplinary insights, which foster learning across different fields. Furthermore, ID_10 acknowledges the AI's proficiency in text generation, potential in cross-industry applications, and contribution to time efficiency. While they

value the tool's ability to provide quick validation and random insights, they underscore the importance of human cross-verification. Overall, ID_10 suggests a symbiotic relationship between AI and humans, where chatGPT supports generating a broader range of potential ideas and fosters *divergent thinking*.

Figure 8 – Agreement levels of aggregate Economic Sector sub-cases on divergent thinking oriented identified subthemes

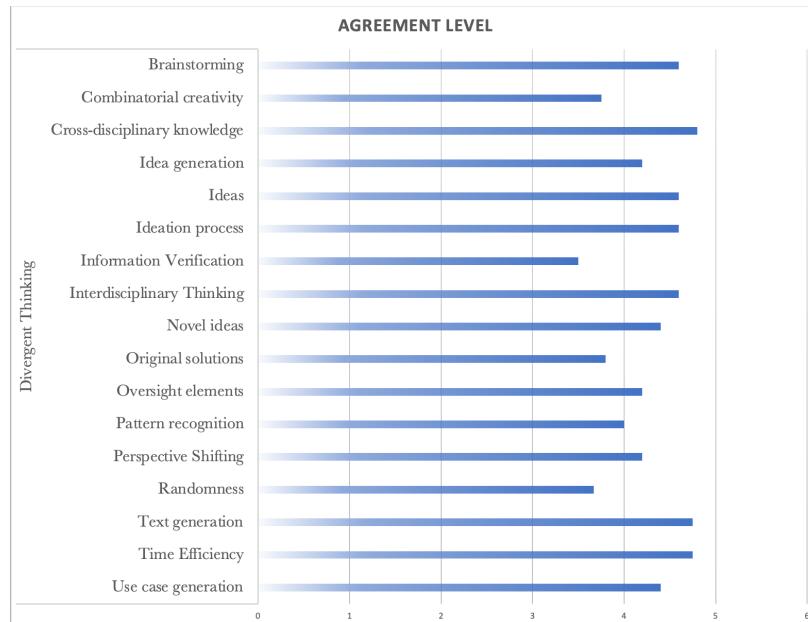


Figure 8 demonstrates the agreement levels of the aggregate Economic Sector sub-cases on *divergent thinking*-oriented subthemes. These subthemes embody the previously explained facets of how cGAI has been shown to foster *divergent thinking* within the creative process. The table indicates high agreement levels for subthemes, such as "Cross-disciplinary knowledge," "Brainstorming," "Ideation process," "Ideas," and "Interdisciplinary Thinking," with "Cross-disciplinary knowledge" leading at an agreed level of 4.8. These aspects highlight the significance of cross-sectoral knowledge and the ability to ideate and brainstorm effectively in creative processes. The mid-level agreement was found in subthemes like "Novel ideas," "Use case generation," "Text generation," and "Time Efficiency," all sitting at 4.75, alongside "Idea generation," "Oversight elements," and "Perspective Shifting" at 4.2. These facets underscore the importance of creating new ideas, efficient time use, and the capacity to shift perspectives. Finally, lower agreement levels, yet still above the midpoint, were observed for "Original solutions," "Pattern recognition," and "Combinatorial creativity," at 3.8, 4, and 3.75, respectively, which are central to generating unique and diverse solutions. "Information Verification" and "Randomness" held the lowest agreement at 3.5 and approximately 3.67, indicating less consensus about their role in *divergent thinking*. The data illuminate the economic sector's perception of the various elements integral to *divergent thinking*, demonstrating an overall high level of agreement on its key aspects.

5.2.3. Context Awareness

The role of *context awareness* in the Creative Problem Solving (CPS) model underlines the significance of its potential enhancement via cGAI from an industrial viewpoint. Industries constantly seek ways to enhance their creative processes, and cGAI offers the potential to augment *context awareness*, enriching problem-solving with a focus on the creative process. The gathered perceptions from industry representatives provide valuable insights into the utility and constraints of cGAI in bolstering *context awareness*. Such comprehensive understanding potentially helps industries evaluate the adoption of cGAI in their creative processes. The aim is to ensure cGAI tools align with and enhance industrial creative problem-solving processes and, in this section to improve *context awareness*.

Participant ID_6 demonstrates a nuanced understanding of cGAI and its potential to enhance *context awareness* in creative problem-solving. They commend chatGPT's ability to understand and respond accurately to queries but express concerns about the tool's contextual memory, pointing to its tendency to forget the context over long conversations. They perceive chatGPT as a proficient tool in narrowing down tasks and assisting in creative activities such as name generation, whose output often matches human creativity. Despite recognising chatGPT's inability to analyse or generate visual assets, they appreciate its capacity to generate prompts for other AI tools. They also point out chatGPT's potential to suggest symbols for specific tasks, contributing to task organisation. While they underscore the instant responsiveness of chatGPT, they voice frustration over the slower response time of its advanced version, GPT-4. They acknowledge the tool's limitations in efficiency, particularly its tendency to overlook task requirements in longer conversations. Overall, ID_6 provides a balanced evaluation of chatGPT, highlighting its strength in context utilisation while raising legitimate concerns about its limitations.

Participant ID_7's perceptions emphasise the instrumental role cGAI can play in augmenting creative processes. Task automation is highly valued, offering relief from mundane tasks, thus fostering an enhanced focus on creativity. The respondent appreciates how cGAI assists task organisation, particularly in optimising content across various social media platforms with differing requirements. A potential drawback observed is the personalisation feature of cGAI, which may inadvertently limit creative diversity by forming a "DNA of creativity" based on user patterns. Additionally, a concern is noted regarding cGAI's retention of creative style information across sessions. Despite criticism, the respondent recognises cGAI as an important creative support tool. They assert that it effectively aids in managing creative workflows, allowing for a more efficient allocation of creative energy. However, it is recommended that future cGAI development focuses on balancing personalisation and diversity to ensure comprehensive creative exploration.

The industrial perspective on cGAI, as seen from the participant's ID_8 point of view, elucidates a distinct focus on the assistance provided by AI tools in managing and enhancing creative workflow. The participant sees potential in AI tools assisting in decision-making, thus extending the realm of *context awareness* into the sphere of critical thinking. The term "Creative Partner" illustrates how the participant envisions AI's role in early-stage ideation, implying the possibility of a synergistic relationship between human creativity

and AI's ability to generate options. The participant values the organisational capabilities of AI tools, appreciating their potential to streamline workflows and organise tasks effectively, further supported by the quote: “[...] the AI tool automatically takes care of your meetings and your notes and your transcripts from those conversations and puts it into a project timeline”. AI's utility is perceived in its capacity to delegate mundane tasks, freeing human focus and creativity as shown in this quote: under the conceptual label “Automated Delegation”: “Or you can outsource this whole communication flow process that then means that you will have much more space to focus on the creative side.”. In summary, the participant perceives AI tools not just as tools but as potential partners in the creative process, thereby fostering a more efficient and innovative workflow.

The participant's ID_9 perception of cGAI is intricately tied to recognising its limitations and the potential for personal adjustment to its functionality. A notable element in the dialogue was the discussion about the “Context Limitation” of chatGPT, indicating a keen awareness of its structural confines and acknowledging the expanded memory in newer versions like GPT-4. This nuanced understanding of the technology underscores the importance of *context awareness* for enhanced communication. The notion of a “Learning Curve” suggests that the utility of these tools may depend on the user's adaptability. Despite potential challenges in workflow integration, they note the tool's use in task organisation and streamlining through the generation of contextual summaries. Furthermore, the participant's recognition of “Creative Support” in generating dialogues underscores the tool's capacity to facilitate creative problem-solving. This viewpoint extends to “Workflow Integration,” suggesting a dynamic interaction between human work habits and the tool's capabilities. The participant perceives the tool's ability to generate a “Contextual Summary” as beneficial for workflow streamlining, underscoring the role of cGAI in making sense of complex dialogues or data sets. In conclusion, the participant's perceptions highlight the interplay between human adaptability, AI capabilities, and the creative process.

The perceptions outlined by Participant ID_10 underpin a cautious optimism about cGAI's ability to improve *context awareness* within creative processes. The participant recognised the value of “Fast Validation,” where cGAI can provide an extensive overview of the problem space during the creative process. However, they also acknowledged the “Misinterpretation Risk,” illustrating a cognisance of potential limitations when subtle emotional cues, vital in human interaction, might be overlooked by AI. This theme of cautious acceptance continued with “Onboarding Automation,” where despite appreciating the potential of cGAI to automate processes, they noted potential drawbacks. The potential of cGAI as an “Intellectual facilitator” was recognised, acknowledging its capacity to streamline workflows, thereby underlining the multifaceted perceptions of cGAI in improving *context awareness* within creative processes. As mentioned earlier, ID_10 values chatGPT's ability to provide a broader perspective, often resembling a helicopter view of complex situations, and its interdisciplinary insights, which foster learning across different fields, ultimately enhancing *context awareness*.

Figure 9 – Agreement levels of aggregate Economic Sector sub-cases on context awareness oriented identified subthemes

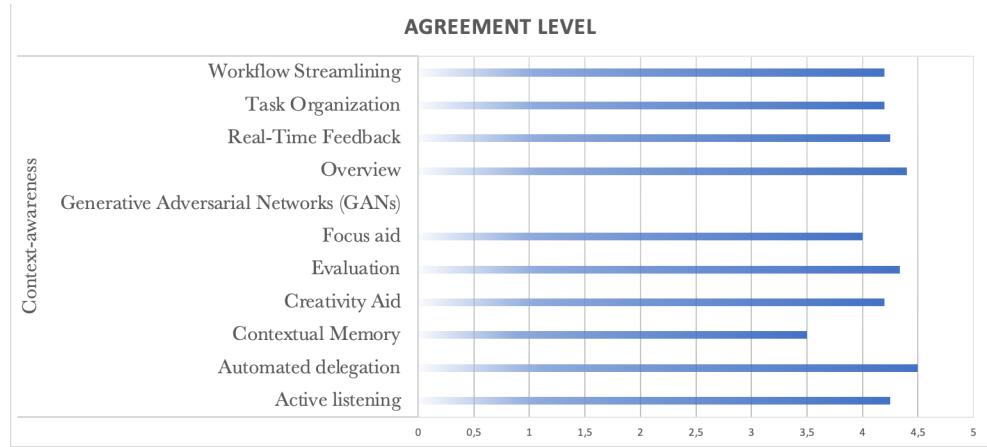


Figure 9 outlines the consensus across the Economic Sector's sub-cases on various sub-themes related to *context awareness* in cGAI. "Overview" garnered the highest agreement level at 4.4, indicating a strong belief in cGAI's ability to provide a comprehensive perspective. Sub-themes including "Automated delegation", "Task Organization", "Creativity Aid", and "Workflow Streamlining" have agreement levels at 4.5, 4.2, 4.2, and 4.2, respectively, reflecting a common understanding of cGAI's capacity for task automation, organisation, enhancing creativity, and streamlining workflows. "Active listening" and "Real-Time Feedback" achieved an agreement level of 4.25, signifying recognition of cGAI's potential for interactive engagement and providing timely feedback. "Evaluation" and "Focus aid", scored at 4.33 and 4, respectively, suggest a moderately high consensus on cGAI's capacity for assisting decision-making and promoting focus. The "Contextual Memory" sub-theme, with a score of 3.5, indicates a somewhat lesser yet substantial agreement on the importance of cGAI's ability to recall past contexts. Lastly, the "Generative Adversarial Networks (GANs)" sub-theme scored the lowest at 0, reflecting a divergence in perspectives on the relevance of GANs in the context of cGAI applications, as GANs were not discussed explicitly in the ES case.

5.2.4. Real-time Support and Feedback

Real-time support and feedback are integral to the creative process, characterised by a cyclic, iterative progression between generative and exploratory stages. This dynamic is well-exemplified in the Geneplore model of creative cognition, developed by Finke, Ward, and Smith (1992), which underscores the pivotal role of assessing creative concepts in driving creative outcomes. Ideas are continuously produced, analysed, and refined throughout the creative process, a progression this study calls "*real-time support and feedback*". This study will present the participants' perceptions of these aspects when using cGAI.

In line with Proposition 3, interviewees expressed positive perceptions of cGAI's potential to enhance *real-time support and feedback* in the creative process. Participant ID_6 recognised its potential to significantly reduce support times, providing swift responses, which is crucial in the dynamic environment of the creative

process. Next, it was noted that cGAI's strength lies in its comprehensive knowledge base, including extensive familiarity with help centre articles and specific guidelines like those of Azure. ID_6 appreciated their ability to reference the source of information when providing answers, reinforcing trust in its suggestions. They also acknowledged the potential of cGAI as a troubleshooting aid and its ability to replace a substantial part of the support workflow. The participants emphasised the value of cGAI's ability to ask guiding questions based on the context and its potential for personalising responses, further enhancing its utility as a real-time support tool. While recognising the inherent limitations of cGAI in handling creative or non-standard tasks, they envisaged great potential in a collaborative human-cGAI setup.

Participant ID_7 underscores the significance of *real-time support and feedback*, largely driven by the efficiency and speed of AI technologies like chatGPT. They perceive these technologies as a game-changer in reducing response times, which is highly valued in customer interactions. Another strong point is the ability to manage and efficiently navigate through large volumes of information is another strong point, enabling quick and contextually relevant support. The participant also acknowledges the importance of AI's interactivity, facilitating a cyclical flow of communication and fast responses. Another interesting observation is the participant's appreciation for chatGPT's language versatility, enhancing comprehension and breaking down language barriers. A cooperative approach is encouraged, with AI technologies aiding human agents to deliver better support. Regarding proactivity, the participant views AI as a tool that can quickly respond to and anticipate customer needs. Despite the positive perceptions, they also emphasise the role of human involvement in ensuring the accuracy of AI responses.

Participant ID_8 has a cautious yet hopeful perspective regarding the potential of cGAI in enhancing *real-time support and feedback*. They acknowledge the potential of AI to enhance efficiency and reduce response time but express some reservations about its application in delicate tasks. While they perceive potential benefits in using AI for aid and task efficiency, they strongly prefer human support, expressing uncertainty about AI's ability to provide personalised responses. Interestingly, they recognise AI's potential to assist in creative tasks such as reframing problems. Despite their uncertainties, they acknowledge the potential for a collaborative approach between humans and AI, leveraging the strengths of both.

Participant ID_9 appreciates cGAI's capacity to enhance efficiency and speed. They value AI's ability to streamline tasks, provide quick information access and assistance, and generate insights for reflection. Recognising the interactivity provided by AI, they acknowledge the potential for a beneficial feedback loop in communication. They also appreciate the personalised response capabilities of AI, offering tailored assistance to individual needs and personalities. Despite their optimism, they draw a clear line between human and AI capabilities, discounting the latter's ability for empathetic communication and expressing concern about potential errors. They see AI as collaborators enhancing human effort, not as replacements, with capabilities that can extend to reinterpret text for diverse perspectives, as shown in the quotes under conceptual labels "Emphatic Communication" and "Text Reframing", respectively: "I would

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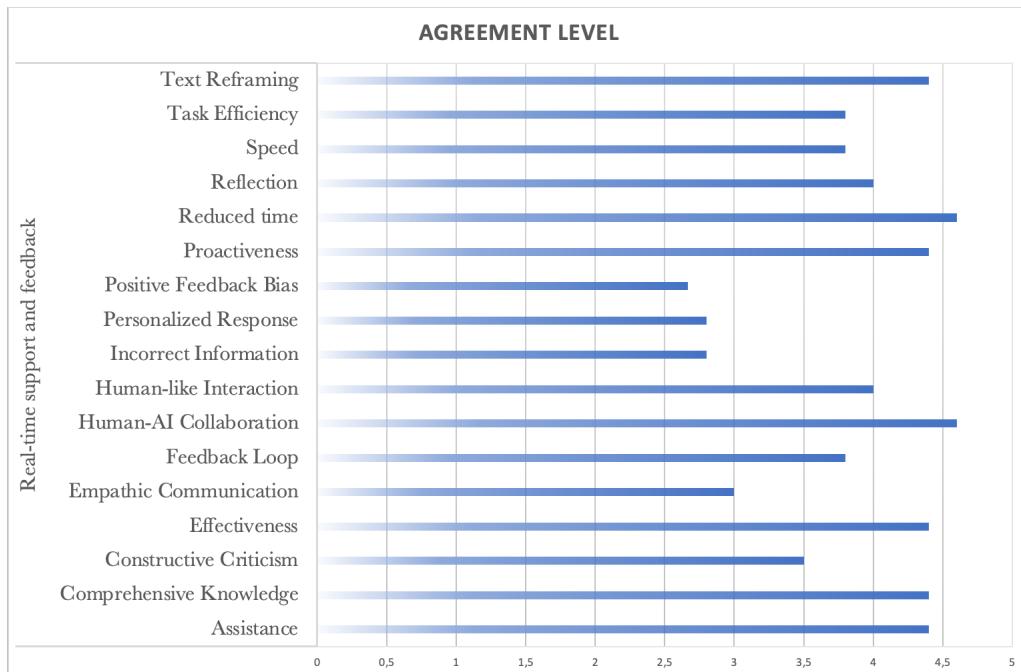
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not consider it as a colleague or as an entity capable of free will.” - “...Then you have another GPT model that takes these five answers, looks at them and evaluates them. [...] It can come up with very creative, different ideas”. However, they remain mindful of AI’s non-human nature and limitations.

Participant ID_10 commend their time efficiency and helpfulness, observing how it can rapidly assist with queries and tasks. The participant perceives chatGPT’s interactive feedback loop and ability to provide personalised responses as advantageous, further contributing to task efficiency. The following quote attributed to the conceptual label “Task Efficiency” supports the previous analysis: “So building right workflows where the demand side is taken care of can be very effective”. They acknowledge the potential of chatGPT to prompt thoughtful reflection but express concern about possibly losing personal creativity in the process. They value the speed of the AI and its capacity to reframe text, hinting at a general positive bias towards the technology. The idea of “Rapid Prototyping” was perceived as a significant benefit of using cGAI, facilitating quick feedback during ideation and potentially accelerating the process. However, they also observe that AI lacks emotional context, an inherent limitation. Nonetheless, the participant maintains a view of human-AI synergy as beneficial and appreciates the comprehensive knowledge base of AI.

The results of the levels of agreement on *real-time support and feedback*-oriented subthemes are detailed in Figure 10.

Figure 10 – Agreement level on *real-time support and feedback* - oriented identified subthemes



The subthemes are diverse, capturing various facets of cGAI’s *real-time support and feedback* capabilities. The highest agreement level (4.6) was achieved for the subthemes of “Reduced time” and “Human-AI Collaboration”, implying a solid consensus among participants that cGAI significantly enhances efficiency and productivity and that collaboration between humans and AI is greatly valued. Subthemes such as

“Assistance”, “Effectiveness”, “Text Reframing”, “Proactiveness”, and “Comprehensive Knowledge” demonstrated a high level of agreement at 4.4, indicating an appreciation of cGAI’s ability to provide support, generate compelling results, reinterpret text, show initiative, and utilise a broad knowledge base. A moderate level of agreement was seen for “Reflection” (4), “Task Efficiency” (3.8), “Speed” (3.8), and “Feedback Loop” (3.8), pointing to a recognition of cGAI’s reflective capacity, its impact on task efficiency, its speed in responding, and its ability to maintain a cyclical flow of communication. Meanwhile, “Human-like Interaction” (4), “Constructive Criticism” (3.5), and “Empathic Communication” (3) received lower agreement scores, reflecting some scepticism about the capacity of cGAI to emulate human interaction, deliver consistent, constructive feedback, and demonstrate empathy. Lastly, “Positive Feedback Bias” (2.67), “Incorrect Information” (2.8), and “Personalised Response” (2.8) yielded the lowest agreement levels.

5.2.5. Case Summary and Conclusions

The report presents a comprehensive evaluation of Conversational Generative AI (cGAI) by five participants from varied professional backgrounds in the technology-intensive industry. These participants range from developers to data scientists to innovation strategists, collectively contributing to a profound discourse on the role of cGAI in their fields.

On the subject of *divergent thinking*, brainstorming emerged as the most agreed-upon benefit of cGAI, scoring an average agreement level of 4.8 out of 5. Participants also highly rated the AI's ability to aid idea generation, cross-disciplinary knowledge, and text generation. However, the report noted mixed perceptions about its role in generating original solutions, interdisciplinary thinking, and pattern recognition, with slightly lower agreement levels. Elements such as perspective shifting, use case generation, information verification, and randomness demonstrated some ambivalence, indicating areas for further improvement. In the context awareness aspect, the participant views varied significantly.

The report acknowledges cGAI's ability to enhance *context awareness*, with participants valuing its capabilities in managing complex project details, adapting to diverse client inputs, and task delegation. However, there were reservations about certain cGAI models, such as GPT-3.5 and GPT-4, concerning their capacity to effectively store and recall past interactions. Concepts such as "Task Organization" and "Workflow Streamlining" received the highest average agreement score of 5, indicating respondents' recognition of cGAI's capability to provide a comprehensive understanding of the given context. Conversely, categories such as "Active Listening" and "Evaluation" scored lower, averaging 3, indicating areas that need further development.

Regarding *real-time support and feedback*, participants appreciated cGAI's ability to improve efficiency and productivity, resulting in the highest agreement for "Reduced time" (4.4/5). However, elements such as "Text Reframing", "Reflection", "Constructive Criticism", "Human-like Interaction", "Proactiveness", "Incorrect Information", "Positive Feedback Bias", and "Empathic Communication" received the lowest agreement, with scores ranging from 2 to 3.5. These areas underline the need for enhancement to improve the effectiveness of human-AI collaboration. Conclusion The report provides a nuanced understanding of the role of cGAI in creative problem-solving within the technology-intensive industry. There's substantial acknowledgment of its potential in

fostering divergent thinking, enhancing context awareness, and providing real-time support. However, the participants also express reservations and skepticism in some areas, indicating the need for improvement. The findings offer invaluable insights for industries contemplating the adoption of cGAI in their processes, highlighting both the potential benefits and limitations. It emphasizes that while cGAI offers numerous advantages, further refinement is needed to ensure its effective collaboration with human agents in delivering optimal outcomes.

5.3. Comparative Analysis across Cases

The importance of the academic context for technological innovation is often underestimated, with the prevailing focus typically skewed towards managerial implications and business advancements (Rombach & Achatz, 2007). However, a more holistic perspective reveals that the academic world is a fundamental pillar supporting and driving technological innovation (Oster, 2022; Zhang & Rogers, 2009). Academic research often functions as an incubator for groundbreaking ideas, novel methodologies, and pioneering technologies (Zhang & Rogers, 2009). These institutions provide an environment conducive to the deep exploration of ideas, unencumbered by the demands of immediate profitability that typify the corporate sphere. This freedom encourages intellectual curiosity and fosters fundamental breakthroughs (Mansfield, 1995). Such collaborative efforts frequently yield innovative solutions that may not have emerged within the confines of industry-specific context (Mansfield, 1995).

A comparative analysis of the usage of technologies, such as AI models like chatGPT, in academic and industry contexts is pivotal. This examination serves to elucidate the distinctive objectives, constraints, and approaches each context employs, inherent in their perceptions. Such approach provides insights into how each sector leverages technology to address unique challenges. The outcome of this analysis can potentially inform opportunities for collaboration between the two, fostering accelerated innovation and bridging theory-practice gaps. Ultimately, such comparative analysis supports future trend forecasting, facilitating proactive creative planning in both academia and industry, thereby enhancing the overall understanding of technology's societal role.

5.3.1. Cross-Case Analysis

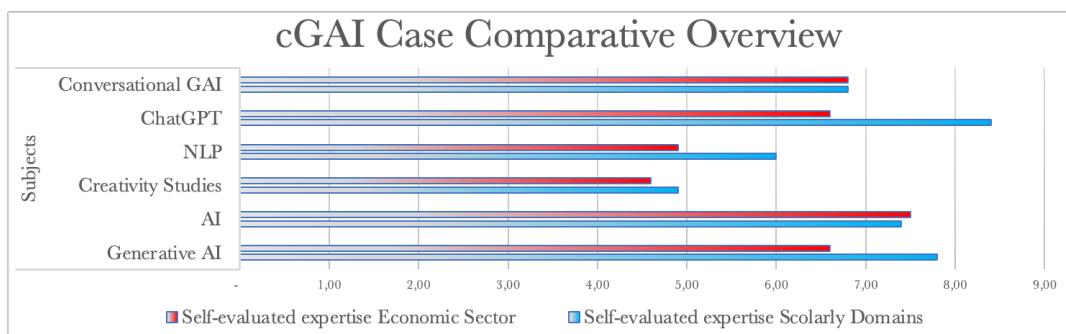
Cross-case analysis plays a critical role in multi-case research by extending the validity of findings beyond individual cases (Miles & Huberman, 1994; Pare, 2004). Moreover, it deepens comprehension and facilitates theory development (Wagner et al., 1968).

The following sections build upon the individual case reports, comparing the two prominent cases, “Scholarly Domain” and “Economic Sector”. This sheds light on the cGAI applications and the contextual backdrop informing the decisions made in different scholarly and industrial domains. Multiple tables will be incorporated to document the individual cases, enabling a consistent comparison from simplified observations. Following this, general and construct-specific comparisons will be discussed, and finally, the outcome analysis will identify the differences between the cases studied.

5.3.2. Case Comparison

A comprehensive summary encapsulating the backgrounds of all sub-cases can be found in Table 4, section 4.2.8. It is important to note that, in addition, a round of self-evaluation was conducted on subjects related to cGAI, with this table serving as a reference. The following table offers a deeper overview of the two cases, outlining their self-assessed expertise in these subjects, industries, or fields of study and their perceptions of the various subthemes that revolve around the three central constructs of the conceptual model, as illustrated in Figures 1 and 3 in sections 3.2 and 4.4.3 respectively. While all participants are from diverse academic backgrounds and leverage cGAI within their practices, significant disparities between cases exist. These differences are not only in their backgrounds but also in the motivations for using cGAI and the extent of its implementation within their fields. Accordingly, comparing their work environments is essential to fully understand their differences and draw broad, meaningful conclusions about each group. The SD, comprised of academics, researchers, and educators, primarily engages with cGAI in experimental and theoretical domains. Their work involves academic research, theoretical exploration and, in some cases, philosophical analyses of AI's implications of AI their use of cGAI is different from the ES. Conversely, the Enterprise Sector, composed of industry professionals such as entrepreneurs, data scientists, and engineers, leverages cGAI more practically to tackle industry-specific challenges, innovate products and services, and boost business efficiency.

Figure 11 – Comparative Overview of Sub-Cases' Expertise



Notably, while there is a prevalent and high focus on all constructs, the extent and context of this focus significantly diverge. The Economic Sector (ES) participants exhibit a stronger tendency towards self-assessed proficiency and perceive a greater benefit across the creative process facets. In contrast, despite their self-assessed higher expertise, the Scholarly Domains (SD) participants perceive a lesser benefit across the creative process facets. This data further elucidate the apparent divergence in self-assessed expertise and perceived benefit between the ES and SD groups. For instance, in Generative AI and chatGPT, SD participants rate their expertise substantially higher than their ES counterparts, with scores of 7.80 and 8.40, respectively, compared to ES's 6.60 in both cases. This confirms the higher self-evaluated expertise among SD participants in these domains. Interestingly, the ES participants assess their expertise marginally higher

in the AI domain than SD participants, with 7.50 compared to 7.40. However, in the areas of Creativity Studies and NLP, the SD participants again hold a marginal edge, with scores of 4.90 and 6.00 as opposed to ES's 4.60 and 4.90, respectively. Regarding Conversational GAI, both groups demonstrate equal self-assessed expertise, with an average rating of 6.80. This intriguing uniformity could potentially suggest a more standardised understanding and proficiency across both domains concerning Conversational GAI.

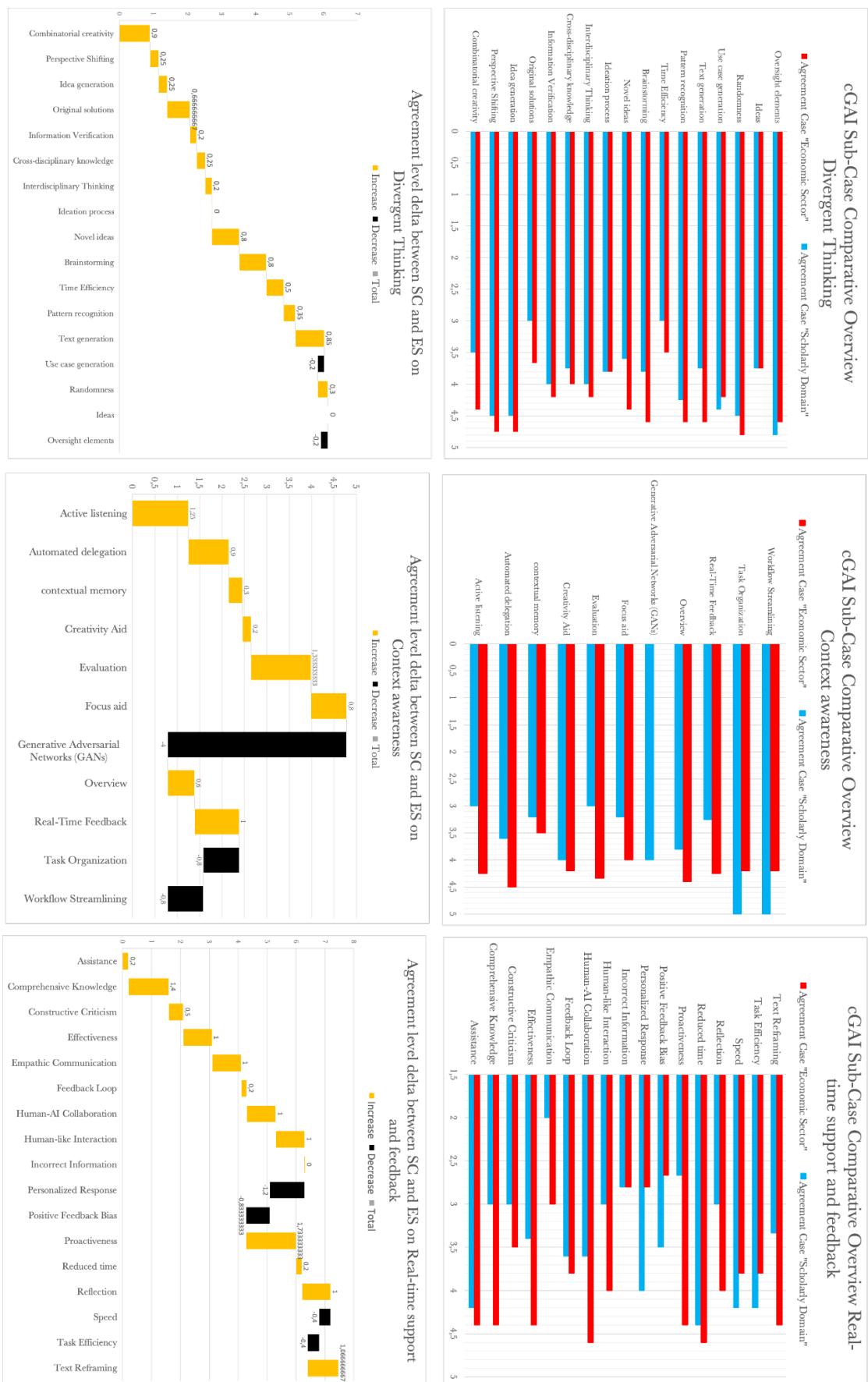
5.3.3. Comparative Analysis of Case Study Outcomes

Intriguing insights emerge after comparing these observations with data depicting agreement level trends for all identified subcategories across the two cases. Specifically, the comparative set of graphs presented in Figure 11 shows that despite the self-assessed higher expertise of SD case participants, they overall perceived a lesser benefit across the three analysed facets of the creative process as opposed to the ES case participants, as previously illustrated in Figure 12. Figure 12 presents the subthemes and their respective agreement distance between the cases, facilitating a more granular understanding of how each is perceived within the distinct contexts. To be more precise, by subtracting the average perception per subcategory for the ES from that of the SD; the resultant “Delta” value encapsulates the level of agreement differential between these two sectors.

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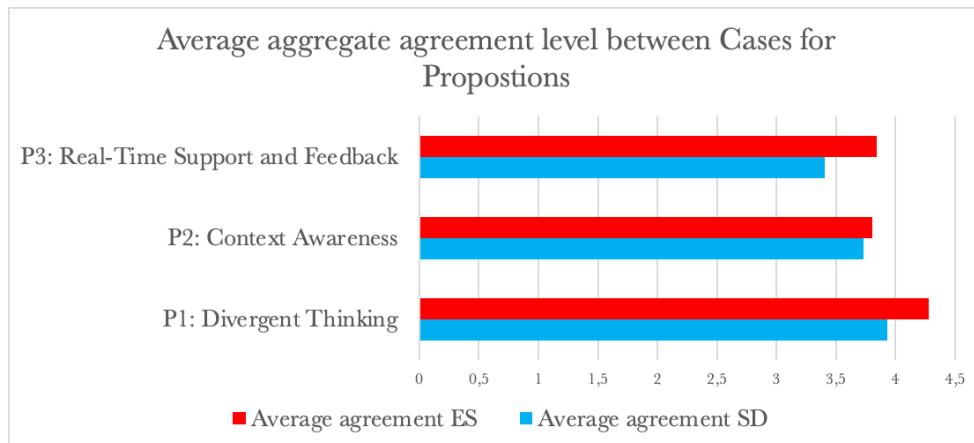
Figure 12 – Side-by-side comparison of perceived agreement levels on identified sub-categories



The first cluster of subthemes about creative processes, combinatorial creativity, and text generation stood out with a Delta value of 1, indicating higher agreement among ES participants than SD participants. Conversely, “Use case generation” and “Oversight elements” showed a negative Delta, hinting at a more powerful endorsement from SD participants. The second cluster of subthemes, relating to *context awareness*, portrayed “Active listening” with a Delta of 1, reflecting greater consensus among ES participants. However, a negative Delta value for “Generative Adversarial Networks (GANs)” implies a more prominent endorsement by SD participants. Lastly, the cluster regarding *real-time support and feedback* demonstrated a Delta value of 1.6 for “Proactiveness,” underlining a higher level of agreement within the ES. Nevertheless, “Personalized Response” and “Positive Feedback Bias” recorded negative Deltas, indicating more robust agreement among SD participants. These Delta values offer valuable insights into the nuanced perceptions of cGAI’s capabilities across different professional spheres, reflecting the unique needs, priorities, and expertise inherent in each.

5.3.4. Analysis of Cross-Case Outcomes

Figure 13 – Average aggregate agreement level between Cases for Propositions



Revisiting the initial conceptual framework, this thesis aims at identifying whether the three aspects shown to enhance the creative process already, as shown in past literature: (1) *divergent thinking*, (2) *context awareness* and (3) *real-time support and feedback*, are moderated by the use of cGAI.

Upon preliminary analysis of the empirical data, we can conclude that the participants’ perceptions were predominantly affirmative and that the application of chatGPT generally has aided the creative process in the presented cases. However, it is noteworthy that many participants underscored the limitations of such computational models and the potential risks associated with their overutilisation. This led to extensive discussions on the possibility of over-reliance, the imperative need for rigorous fact-verification, and the lack of authentic, human-like emotional feedback, factors that emerged as a requisite for a consistent and high-quality creative process.

The case study findings present both similarities and differences across the cases. The disparities lie in the perceived benefits and applications of cGAI, with ES participants emphasising “combinatorial creativity” and “text generation,” while SD participants place greater weight on “Use case generation” and “Oversight elements.” These contrasts indicate that different fields might leverage cGAI differently based on their unique requirements and objectives.

These findings reflect on the broader study context, emphasising that while cGAI can enhance creative problem-solving, its impact and utility may significantly differ depending on the field’s specific needs and contexts. The subsequent chapters of this study explore the emerging themes from this cross-case analysis in greater depth. The focus is to understand the reasons behind the disparities in perceptions, subtle elements to the initial conceptual framework and what aspects of cGAI technology and its interaction are crucial for successful creative process enhancement.

6. Discussion

This study has synthesised relevant literature from various disciplinary perspectives and formulated a conceptual model that posits cGAI to enhance the creative process in the realm of work, specifically on three levels, (1), (2), (3). Acknowledging the recent advancements in generative AI language models like GPT-3, this research explores the potential of cGAI as an assistant for augmenting the creative process through conversation with the tool. By bridging the fields of philosophy of mind, cognitive science, computer science, and AI research, this study addresses gaps in understanding the role of cGAI in augmenting creativity, focusing on three key creative process components (*divergent thinking, context awareness, and real-time support and feedback*). This section further develops the conceptual framework by evaluating the gathered empirical data.

Overall, in both cases, participants highlighted the current inability of cGAI to operate in a multimodal context, explicitly mentioned by ID_6: “[...] chatGPT in its current form is not able to analyse or generate visual assets.”; thereby handling and generating different data formats from the text. Paradoxically, the broad scope of cGAI applicability, as evidenced by the perspectives of all contributors, challenges the assertions by Cetinic, Z., and She, L. (2021), which confine the utilisation of generative AI to specialised domains such as graphic design.

Additionally, focusing on the impact cGAI has on the workflows of experts in the SD and ES domains offers further depth to the scholarly discourse initiated by Kasneci, G. et al. (2023), highlighting the noticeable gap in the literature concerning the impacts of cGAI on business and research processes, as most research tends to focus on the technical aspects.

Furthermore, the diverse usage scenarios of cGAI proposed by the participants exhibit its capacity for logical writing style, impartiality, and tendency to generate comprehensive responses, aligning with the stipulations by OpenAI (2023). Such findings illustrate the versatile potential of cGAI, hence giving purpose to this papermaking this paper showcasing the broader application of cGAI across various fields.

Notably, an overwhelming majority of the study participants, across both delineated cases, when considering the dimension of *real-time support and feedback*, explicitly favoured the utilisation of chatGPT over a human counterpart. The preference towards chatGPT emanates from its inherent qualities, such as inexhaustibility, perpetual availability, and unwavering objectivity. This preference resonates with the empirical evidence presented by Guo, F. et al. (2023), which underscores the perceptible parallels and comparability between the communication styles of chatGPT and humans. Furthermore, their research emphasises a predisposition for chatGPT, particularly under the evaluative criterion of “helpfulness”.

Ultimately, this research significantly aligns with the central research purpose of the study, contributing to the extant literature on the Creative Problem Solving (CPS) model by Osborn (1963). It does so by furnishing a substantial corpus of empirical evidence elucidating the tools and key considerations indispensable for amplifying creative problem-solving capabilities, as depicted in the scenarios provided to participants to stimulate in-depth dialogue.

The analysed perceptions in both cases emphasise the centrality of creativity in the era of human-machine collaboration. This assertion is illuminated by the flexible and comprehensive discussions proffered by the participants concerning their creative workflows, therefore showing strong resonance with findings by Corazza (2017). This observation is noteworthy, particularly considering the participants' limited, and in some instances non-existent, expertise and academic grounding in creative studies, as depicted in Figure 11.

In conclusion, considering all previously mentioned contributions to past literature, findings contribute to the ongoing dialogue in the field, showing tendencies in line with the body of research exploring the connection between creativity and human-AI interactions by Bernard (2023); Bieser (2023); Cetinic & She (2021); Davenport & Mittal (2022) and Hughes, Zhu, & Bednarz (2021).

6.1. Examination of Propositions

Within the conceptual model, the key components are translated into propositions, which will now be examined individually. Furthermore, the upcoming discussion will delve into these sub-propositions, leading to the verification of the key propositions.

6.1.1. Divergent Thinking

Proposition 1: Using cGAI improves *divergent thinking* by generating a broader range of potential ideas and fostering connections between disparate concepts, enhancing creative problem-solving.

The findings extend the current understanding of how cGAI can enhance *divergent thinking* by examining participants' experiences and perspectives. The study offers new insights into how cGAI can be utilised in different aspects of creativity and problem-solving. This includes brainstorming, generating ideas, cross-disciplinary knowledge integration, and text generation. The detailed examination of each theme also

extends existing knowledge by highlighting potential challenges and limitations of cGAI in these areas, offering a balanced and comprehensive understanding of its potential. By linking the role of cGAI in *divergent thinking* with concrete experiences and professionals' perceptions, the study extends the practical relevance of the CPS model (Osborn, 1963). Accordingly, participants recognised an improved ability to connect seemingly unrelated subjects. This provides a more nuanced understanding of how AI can be integrated into human cognition processes and contribute to the creative process of *divergent thinking*. Although, it became clear that participants saw as a crucial element human engagement and the capability to communicate with the cGAI as a crucial element, ultimately emphasising the importance of skilled human-AI collaboration.

It is important to note that throughout the discussions with participants, no clear reference was made to the three key enhancers of the creative process. Therefore, the underlying attempt is to stimulate the participant's views and experiences to suggest common patterns with the propositions and potentially further develop the constructed conceptual framework. The following section will present how findings from this study, highlighting several key components that contribute to enhancing *divergent thinking* through cGAI, are aligned with seminal works in creativity research mentioned in the literature review. Subsequently, themes that seem less aligned with previous research are mentioned and proposed as potential elements to be added to the conceptual framework illustrated in Figure 14 in a subsequent section 6.4.

Considering literature by Goldschmidt (2016), indicating that *divergent thinking* refers to the creation of numerous unique ideas and the exploration of multiple possibilities, in the SD case, several participants demonstrate various degrees of alignment with Goldschmidt's (2016) notion of *divergent thinking* through their perspectives on using cGAI. Participant ID_1 firmly agrees with the idea of cGAI enhancing *divergent thinking*, appreciating its role in generating original ideas, bridging disciplines, and facilitating problem-solving. Participant ID_2 recognises the potential of cGAI in generating diverse ideas but maintains some scepticism regarding its application. Participant ID_3 endorses the use of cGAI in facilitating multidisciplinary discourse and hastening the ideation process while emphasising the need for human refinement of AI outputs. Participant ID_4 acknowledges AI's potential in boosting *divergent thinking* but questions the novelty and relevance of AI-generated ideas, encouraging human evaluation of AI outputs. Lastly, Participant ID_5 perceives cGAI positively, viewing it as a tool that stimulates cross-disciplinary knowledge and generates novelty, thus contributing to *divergent thinking*. In conclusion, all participants recognise the value of cGAI in *divergent thinking* to varying extents but also underscore the critical role of human intervention in leveraging its benefits.

Within the ES case, ID_6 views chatGPT as a reliable resource for idea generation, lauding its ability to recognise patterns and harness interdisciplinary knowledge. ID_7 underscores the AI's role in knowledge aggregation and new idea generation during brainstorming, while ID_8 regards it as a facilitator for *divergent thinking*, contributing novel insights and creative combinations. These perceptions validated research by Davenport & Mitta (2022) discussing the use of GAI in identifying new and innovative solutions, ultimately reaching a deeper understanding of the problem.

Additionally, ID_9 sees chatGPT as a beneficial adjunct in synthesising cross-disciplinary knowledge and instigating perspective shifts. Lastly, ID_10 appreciates the AI's ability to provide broad insights from diverse disciplines, aiding the ideation process and promoting *divergent thinking*.

Proceeding to the newly discovered elements, firstly, the “Information Verification” theme in *divergent thinking* is not traditionally discussed. However, it is an interesting aspect that cGAI could assist with, given its capability to cross-check information across its extensive and diverse knowledge base. In this regard, it was perceived as a creative process enhancer. Secondly, “Randomness” also has shown to be a topic perceived to enhance divergent thought. While randomness can spark creativity, its role in enhancing *divergent thinking* is less emphasised in the literature. Nevertheless, the inherent connection is plausible, as seemingly unrelated concepts can be considered random to some extent. cGAI’s ability to generate “nonsense” or random ideas could be valuable. Lastly, “Novel ideas”: while creating novel ideas is an overarching goal of *divergent thinking*, the way cGAI can contribute to this - such as by combining elements from its wide knowledge base - could be considered a novel extension of existing knowledge. Besides, participants’ perceptions reasoned that the generative aspect of cGAI can not be described as an option for generating fully novel ideas, considering the limited nature of a language model. Therefore, adding this element to the conceptual framework could aim at depicting with higher precision what affects the creative process.

6.1.2. Context Awareness

Proposition 2: cGAI improves *context awareness* by providing relevant information, identifying inefficient approaches, and suggesting alternative solutions around a specific context, enhancing the creative process.

Diverse perspectives have emerged concerning the potential of cGAI in enhancing *context awareness* in the creative process. Participants ranged from being highly optimistic to expressing mixed sensations and even distrust. As derived from the literature, *context awareness* is a crucial aspect of the CPS model (Osborn, 1963). As a component of decision-making processes, it involves understanding and incorporating relevant situational information to generate more targeted and effective solutions. In cGAI, *context awareness* translates into the system’s ability to comprehend the user’s situation, intentions, and overarching circumstance, to respond effectively and meaningfully. In the following, perceptions are revisited to examine which can be associated with the underlying proposition and which cannot.

Starting with a closer look at the SD case, enthusiasts, represented by Participants ID_1 and ID_5, regard cGAI as a key tool in driving creativity and contextual comprehension, attributing capabilities such as efficient summarization, task distribution, extended memory, and active listening to its capability. These perceptions align with research by Moruzzi (2020) highlighting GAI’s potential in the mentioned areas. Their beliefs stem from the premise that cGAI streamlines workflows and underpins holistic task management,

facilitating the creative process. Contrarily, Participant ID_2 perceives the current state of cGAI, specifically models like GPT-3.5 and GPT-4, as underwhelming in their context retention and response generation. They question the models' proficiency in task delegation, hinting at limitations in prompt engineering and overall responsiveness. In this vein, the potential of cGAI to boost *context awareness* appears to be overshadowed by its operational challenges. In a nuanced middle-ground, Participants ID_3 and ID_4 appreciate cGAI's capability in idea generation and summarisation capability. Nevertheless, they underscore its memory limitations and suggest the need for human oversight in assessing AI output. While acknowledging cGAI's potential to augment *context awareness*, they highlight the technology's limitations. Collectively, these perceptions illustrate the divergent perspectives surrounding the application of cGAI in creative problem-solving. Even as cGAI presents a promising frontier for enhancing *context awareness*, its existing limitations necessitate further advancements. This offers rich potential for future research and development in this rapidly evolving field.

Subsequently, inspecting the ES case specifically, participant ID_6 lauds chatGPT's capacity for context clarifying, despite various concerns about its context retention in lengthy conversations. They acknowledge the tool's ability to assist creative activities and task organisation, although they criticise its efficiency in longer conversations. Participant ID_7, in this context, only mentioned the capability of cGAI to aid in task management but did not further elaborate on its capabilities in context enhancement. ID_8 envisages AI's role in *context awareness*; they also appreciate AI's potential in workflow organisation and mundane task delegation. ID_9 perceives cGAI's potential concerning the user's adaptability, recognising its facilitating role; they expressed that using an AI like chatGPT can help generate new insights and unique creative ideas. He suggests that the cGAI's capability to generate summaries is advantageous for streamlining workflows. Nevertheless, its limited context memory is critically discussed, bringing difficulties in fully validating ID_9's perception with Proposition 2. Finally, ID_10 expresses cautious optimism, acknowledging cGAI's ability to provide a comprehensive perspective of the problem space. However, they caution about possible misinterpretation risks when AI might overlook emotional cues.

Finally, additional topics which do not closely relate to the literature on *context awareness* have been identified in participants' perceptions, namely "Task Automation" and "Intellectual Facilitator". The first, highly present in perceptions by ID_7 and ID_8, indicates the ability of cgAI to automate certain repetitive elements of a given task, which allows for enhanced focus on the overall aim of the problem at hand, ultimately found to enhance *context awareness*. Similarly, for the second topic, ID_10 suggested that cGAI can be an intellectual facilitator by providing a broader perspective on complex situations and enhancing context-aware problem-solving.

6.1.3. Real-time Support and Feedback

Proposition 3: cGAI enhances *real-time support and feedback* by offering timely, adaptive, and context-aware guidance, improving the quality of solutions and enhancing the creative process.

With a focus on the proposition that cGAI systems enhance *real-time support and feedback* by providing timely, adaptive, and contextually aware guidance, it is essential to elucidate how gathered perceptions intersect with this proposition. In the following, acknowledgements of participants are presented and connected with Proposition 3. Besides, this section aims to further develop the conceptual framework by identifying themes covered in the discussions with the cases aroused when discussing *real-time support and feedback* scenarios.

Firstly, starting with the SD case, participants predominantly acknowledge the proficiency of cGAI in promoting efficiency and facilitating continuous learning, recognising its potential in tailored assistance. Participant ID_1's views align with research highlighting AI's ability to enhance productivity, provide personalised responses, and facilitate learning through iteration (feedback looping). However, concerns around chatGPT's uncritical affirmations and potential for incorrect information signal the need for improved critical and accurate feedback in AI systems, areas for further research and development. Participants ID_2 and ID_3 echoed similar sentiments; however, concerns were brought to light regarding the quality of feedback from cGAI.

Secondly, looking at the ES case, Participant ID_6 emphasises the utility of cGAI in reducing support times when collaborating with other workers or clients and offering trustworthy suggestions, viewing its potential to revolutionise the support workflow. Participant ID_7 lauds the speed and efficiency of such AI systems, emphasising their language versatility and capacity to anticipate customer needs. However, they also underscore the importance of human involvement for accuracy. Participant ID_8 shares a cautiously optimistic view, recognising the efficiency of AI while expressing reservations about its applicability in delicate tasks. They encourage a human-AI collaborative approach despite their uncertainties. Participant ID_9 values AI's task streamlining capabilities and the interactive feedback loop of AI; however, they express concern about its empathic communication capacity. Participant ID_10 appreciates AI's ability for quick assistance and task efficiency but notes potential concerns about loss of personal creativity. Despite scepticism, participants agree on AI's potential to enhance *real-time support and feedback* in human-AI collaboration.

Finally, our current conceptual model is enriched by incorporating two new elements: "Language Versatility" and "Emphatic Communication". The element of language versatility acknowledges the capacity of AI systems to operate across multiple languages, thereby enhancing their inclusivity and universal applicability. Empathic communication, another crucial element, reflects the necessity for AI systems to demonstrate greater emotional intelligence, thus ensuring a more holistic user experience with interpretable intimacy. This inclusion underscores the significance of human-like interaction in AI, suggesting the need for

emotionally intelligent models and promising future technological advancements. Therefore, integrating these two elements can provide a more comprehensive understanding of user-AI interaction and stimulate key research areas in AI-enhanced *real-time support and feedback* mechanisms.

6.2. Summary of Propositions

Through a systematic analysis of the perceptions gathered from participants and their alignment with the conceptual framework, this study has identified the potential inherent to the main research question. The research, employing a deductive approach in the methodology, has generated new sub-propositions that expand the existing conceptual model, providing a more comprehensive estimation of the factors influencing creative performance.

In the case of Proposition 1, which seeks to examine the impact of cGAI on *divergent thinking*, the following sub-propositions have been formulated:

Sub-Proposition 1.1: cGAI facilitates *information verification* in the (1) *divergent thinking* process.

This novel element, not traditionally highlighted in the context of *divergent thinking*, is crucial considering cGAI's capability to cross-check information across an extensive and diverse knowledge base. As perceived by the participants, this aspect is an enhancer of the creative process, thus justifying its addition to the current conceptual framework.

Sub-Proposition 1.2: cGAI facilitates *randomness* in the (1) *divergent thinking* process.

This sub-proposition highlights a less emphasised aspect of *divergent thinking* in the existing literature. The connection is plausible as, besides being an ancient mathematical problem, randomness created by a machine has the potential to connect seemingly unrelated topics. The ability of cGAI to generate 'nonsense' or random ideas is valuable in sparking creativity and promoting the formation of novel connections between seemingly unrelated concepts.

Sub-Proposition 1.3: cGAI contributes to generating *novel ideas*, a core objective of (1) *divergent thinking*.

While creating novel ideas is inherent to the process of *divergent thinking*, the unique contribution of cGAI, such as combining elements from its broad knowledge base, represents a novel extension of the current understanding and shall be denoted more explicitly within the model. Although participants reasoned that the generative aspect of cGAI cannot be described as a tool for generating entirely novel ideas due to the

limitations of a language model, its contribution in this aspect still renders significant value. Adding this element to the conceptual framework will provide a more accurate depiction of what affects the creative process. Concerning Proposition 2, the following sub-propositions have been identified.

Sub-Proposition 2.1: cGAI enhances (2) *context awareness* via efficient *task automation*.

This sub-propoosition explores how cGAI's capacity to automate tasks, as revealed through participants' perceptions in the ES case mainly, can enhance the creative process. By automating certain repetitive elements of a given task, cGAI can free up cognitive resources for the individual, enabling them to understand better and interpret the context of a problem. This enhancement can result in more efficient and targeted solutions, ultimately fostering the intensity of the creative process.

Sub-propoosition 2.2: "cGAI is an *intellectual facilitator* in the (2) *context awareness* spectrum.

As indicated by participants in the ES, this sub-propoosition addresses cGAI's role as an intellectual facilitator. cGAI can broaden individuals' perspectives, thus allowing for a more comprehensive understanding of complex situations. By offering such perspectives, cGAI can augment *context awareness*, leading to improved problem-solving, particularly in tasks that require a deep understanding of nuanced or complicated contexts. Including these sub-propoositions further refines the existing framework by emphasising the role of cGAI in task automation and as an intellectual facilitator, thereby enhancing the understanding of cGAI's impact on the creative problem-solving process. Moreover, these sub-propoositions might encourage additional research exploring how cGAI can further develop these capabilities to support individuals in enhancing context-aware problem-solving.

In conclusion, Proposition 3 within the conceptual framework does not comprehensively sufficiently encapsulate the scope of what constitutes *real-time support and feedback*. Therefore, the following sub-propoositions were built.

Sub-propoosition 3.1: "cGAI enhances (3) *real-time support and feedback* by demonstrating *language versatility*"

This sub-propoosition highlights the importance and capability of language versatility in AI systems, acknowledging the multi-lingual capabilities inherent in advanced AI models such as chatGPT. By operating across a spectrum of languages, cGAI becomes more accessible and inclusive, thus catering to a broader user base. The notion of language versatility resonates strongly with the observations of Participants in the ES

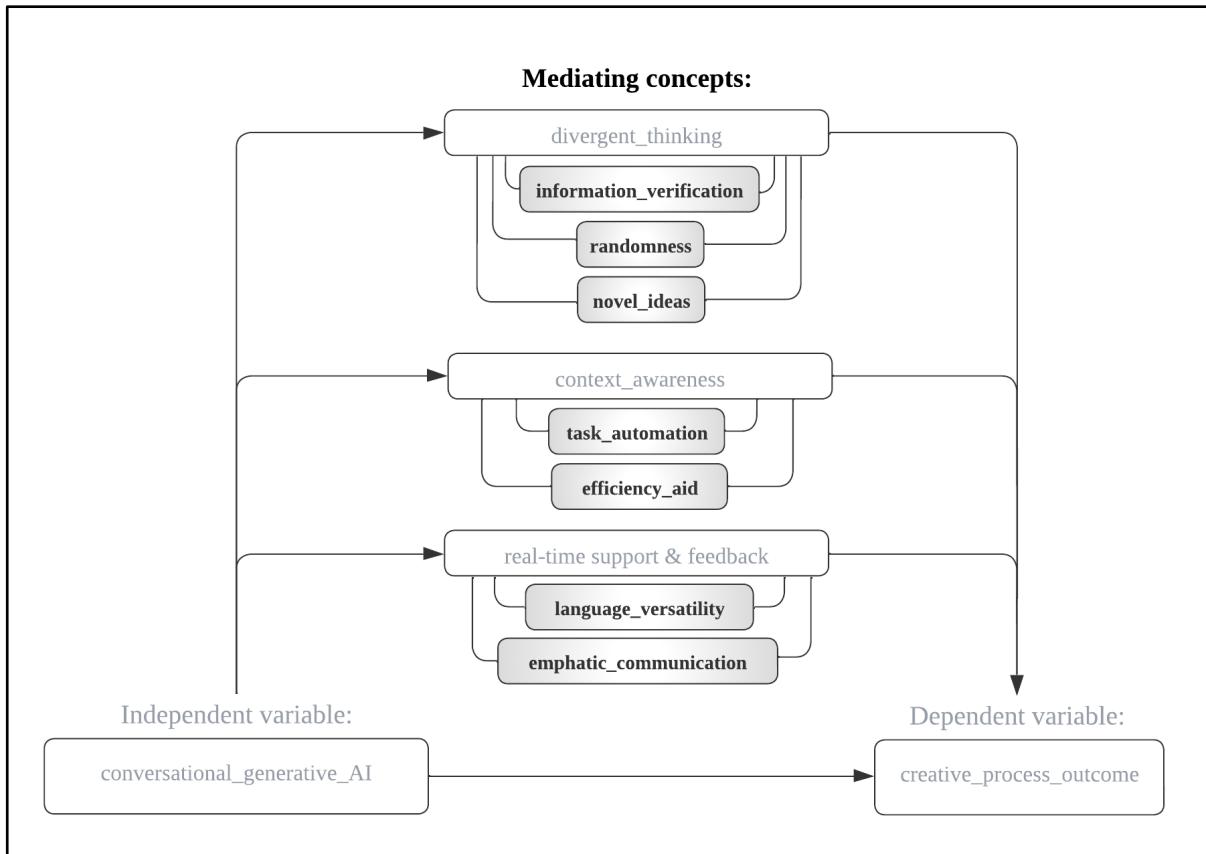
sector who emphasised the utility of such a feature in cGAI, allowing the system to anticipate and cater to diverse customer needs.

Sub-proposition 3.2: "cGAI optimises (3) *real-time support and feedback* by promoting *emphatic communication*"

This sub-proposition addresses the need for AI systems to demonstrate greater emotional intelligence. The ability of cGAI to simulate empathetic communication would add a level of user-AI interaction that echoes the nuance and richness of human-to-human interaction. This is particularly poignant in the context of Participants in both cases, who expressed concerns over cGAI's capacity for empathetic communication. The aim is to ensure that this element constitutes the creative process enhancement yet is very poorly executed by current cGAI systems. Integrating empathetic communication into AI systems represents a stride towards more comprehensive user experiences, promising significant strides in human-A2I collaboration.

Integrating these sub-propositions into the conceptual framework offers a more nuanced understanding of how cGAI enhances the three facets assumed to continue this case study's creative process. They encapsulate the practical experiences and perceptions of the study participants, augmenting the grasp of cGAI applications. This enriched framework, acknowledging AI's identified capabilities that connect to propositions 1., 2., and 3., thus provides a comprehensive perspective on the dynamic nature of cGAI-enabled creative mechanisms. These enhancements prove instrumental in spurring further research and development in AI and pave the way towards more adaptive, contextually aware, and human-centric AI systems. Figure 11 illustrates these findings in an updated conceptual framework below.

Figure 14 – Updated conceptual framework with respectively identified sub-elements



7. Research Limitations and Future Research

Despite the rigor of this investigation, this thesis vividly acknowledges its inherent limitations. The forthcoming section delineates these restrictions in the context of the study's methodology and scope. Accordingly, this chapter aims at showcasing and highlighting aspects that can be further developed to pursue research more precisely towards a vastly AI-enhanced future.

Literature Scope: Despite the diligent pursuit of the most recent and relevant academic resources, the unprecedented surge in discussions and literature on cGAI makes it challenging to maintain an up-to-date depiction of the literature. The rapidly evolving nature of the field results in an ever-expanding body of research and industry reports, which might outpace the current state-of-the-art knowledge presented here. For instance, this thesis investigates the use of cGAI solely applying chatGPT. Due to the limited availability of other powerful large language models, such as Google's Bart, which is exclusively accessible in the United States and the United Kingdom, this limitation becomes evident. However, the widespread use of chatGPT

among participants also enables a more coherent examination of its implications and offers an opportunity to explore its unique features in depth.

Research approach and sample size: The research methodology presents inherent limitations concerning the study's validity. While a qualitative case study approach offers robust exploratory power and comprehensive representation due to its capacity to capture nuanced perceptions of real-life scenarios (Gable, 1994; Merriam & Tisdell, 2015), it is simultaneously challenged by weaknesses in terms of deductibility, repeatability, and generalizability (Lee, 1989; Gable, 1994), even when adhering to the widely recognised case study structure by Yin (2003). To deliver a thoroughly impartial perception of the technology, beyond simply expanding the number of interview participants, integrating a field experiment and quantitative performance assessment of creativity would significantly enrich the ongoing academic discussion concerning cGAI development and adoption. The presented conceptual model could endorse developing a more precise model for executing comparable experiments on a larger scale. Moreover, the sample size selected for this study may appear constrained, given that only ten participants were interviewed. This potential limitation is mitigated by ensuring data saturation; no significant additional sub-themes emerged beyond the sixth interview. However, this does not suggest that expanding the number of interviews would not enhance the study's significance. Quite the contrary, an increased sample size would undoubtedly augment the robustness and generalizability of these findings.

Prompting: Besides the identified nuanced concepts that can potentially indicate what constitutes an elevated creative process through cGAI, this study elucidates that the perception of cGAI's capabilities and benefits can vary even among high-level experts. Contemporary academic discourse commonly references this as "prompting" or "prompt engineering," an aspect that emerged as a central modulating factor encompassing all capabilities associated with cGAI usage in the conversations with the interviewees (White, 2023). Further expanding the model to incorporate this aspect would be greatly beneficial, given the growth in interest and skills related to this area, as highlighted by White (2023).

Analysis Subjectiveness: Although standardised, the approach used in assessing participants' perceptions using a Likert scale and sentiment analysis presents its limitations. The sentiment analysis introduces an element of subjectivity, as the evaluation of the degree of agreement or disagreement might be influenced by the researcher's linguistic intuition and understanding (Merriam & Tisdell, 2015). Likewise, the effectiveness of this approach is closely tied to the researcher's proficiency in the English language, risking misinterpretation of cultural nuances or idiomatic expressions (Polkinghorne, 1995). While standardising responses, the Likert scale potentially oversimplifies complex sentiments, leaving the depth of participant opinions inadequately captured (Joffe et al., 1996). Identifying and assigning conceptual labels to statements depends on the researcher's discernment, risking overlooking crucial insights and introducing potential confirmation bias (Merriam & Tisdell, 2015). Interpreting neutral responses also represents a limitation as they may reflect a middle-ground opinion, lack of understanding, or hesitation to express strong views. Not to mention, the time-consuming nature of this method presents practical limitations, requiring intensive

human input for the data analysis part. Despite these limitations, multiple validation measures such as cross-referencing, peer review, and maintaining a reflective research journal were implemented to ensure the reliability and validity of the findings.

Expertise Paradox: Despite the variations in self-assessed expertise denoted in Figure 11 previously, the noted perception of lesser benefit from the creative process facets among the SD participants remains paradoxical, calling for further investigation, perhaps exploring the expectations, motivations, and practical applications of these different skill sets within the two sectors.

8. Conclusion

This investigation reviewed the literature to formulate a conceptual model positioning cGAI as a tool to enhance the creative process through *(1) divergent thinking, (2) context awareness, and (3) real-time support and feedback*. Through purposive sampling and snowballing techniques, competent industry researchers and entrepreneurs were included as participants, providing valuable insights into the transformation of the creative process influenced by cGAI.

For *divergent thinking* (Proposition 1), cGAI was found to aid diverse elements already found in current literature, and additionally, it was found to contribute considerably to information verification, promote randomness, and generate novel ideas. These newly discovered elements, identified from participant perceptions, were integrated into the conceptual model, enhancing understanding of the impact of cGAI on the creative process. However, the study also emphasised that the optimal application of these benefits requires effective human engagement and skilled human-AI collaboration.

For *context awareness* (Proposition 2), cGAI's promise was noted with its ability to enhance the process through efficient task automation and act as an intellectual facilitator. However, the current limitations of cGAI signal the need for further advancements and research. Here, participant perceptions led to identifying additional topics, "Task Automation" and "Intellectual Facilitator", which could further enhance *context awareness* in future research.

Lastly, for *real-time support and feedback* (Proposition 3), participant feedback affirmed cGAI's proficiency in promoting efficiency and continuous learning. Despite this, concerns were raised about uncritical affirmations and the potential for incorrect information, pointing to the need for improved critical and accurate feedback mechanisms in AI systems. Adding to the conceptual model were "Language Versatility" and "Emphatic Communication," enhancing understanding of user-AI interaction and stimulating key research areas in AI-enhanced *real-time support and feedback* mechanisms. These sub-propositions offer a more nuanced understanding of how cGAI enhances creativity, contributing to a more comprehensive conceptual model that reflects practical experiences and perceptions, thereby augmenting grasp of cGAI applications. Although the study does not establish statistically confirmed conclusions, it provides valuable contextual and practical relevance, offering meaningful insights for future research. The

study's findings thus open a path towards more adaptive, contextually aware, and human-centric AI systems, illustrating the dynamic nature of cGAI-enabled creative mechanisms and signifying a future where cGAI can facilitate the creative process more meaningfully. By exploring the most ambitious goals of Human-AI-collaboration, the study captures the evolving landscape where creativity, a traditionally purely human skill, appears to be rendered replaceable by the current advancements in AI, mainly due to apprehensions surrounding it, thereby failing to comprehend its true potential fully.

In addition to augmenting current literature concerning creativity and its interplay with the digital advancements in GAI, this study also seeks to proffer managerial recommendations, listed below. These propositions hold applicability across a broad array of departments and disciplines, thus establishing their universal relevance.

Effective integration of cGAI: Given the overarching high perception in efficiency enhancement and creative input, managerial staff should actively engage in the most recent advancements in the realm of cGAI-enabled tools. Interviewed experts frequently suggest that the greatest capabilities emerge when individuals excel in the art of prompting, essentially communicating requests adeptly to the generative tool, thereby optimising its potential. This necessitates targeted instruction in the utilisation of cGAI. Having such knowledge across departments in an enterprise could increase efficiency and overall innovation by a considerable amount.

Choice of AI model: The results of this research has underlined the limitations a cGAI tool has, such as their size, proprietary nature, and the tendency to "hallucinate". While generative models such as chatGPT provide creativity and adaptability, extractive models like RoBERTa and ELECTRA can deliver direct and information (Cortiz, 2021). Accordingly, despite the increasing popularity of generative models, extractive models hold unique advantages and have proven more effective in real-world applications like semantic search engines and information extraction systems. Managers should make judicious decisions on which model to use based on the task at hand, as one be more suitable for purely creative compared to more fact-related reasoning tasks.

Balanced Human-AI collaboration: Despite the clearly perceived benefits, cGAI should not replace human creativity. Managers should emphasize the balance between human creativity and AI assistance. It should be considered that not only does AI exhibit considerable limitations at this juncture, with humans often outperforming in terms of innovation, but also that the human role should not mirror AI capabilities. Ultimately, this thesis endeavours to reflect on the human function within a GAI-enhanced environment. Some could perceive this as a threat to human cognitive and creative capacities, as AI could seemingly execute tasks independently, engendering an over-reliance on the human part. However, if viewed exclusively as a tool, new dimensions of innovation can be unearthed, precluding the need for time-consuming, information-intensive, and repetitive workflows intrinsic to the creative process. Such equilibrium would foster an organisational culture that fosters *collaboration between* the two entities, rather than *prioritising one* over the other.

Encourage Innovation and Adaptability: Among this ever-changing evolving environment of aggressive AI adoption, it is crucial for managers to guarantee their organisations' readiness to adapt to such innovations. This may encompass the development of innovative strategies ingrained with AI tools and keeping abreast with the latest research in the field, whilst concurrently nurturing an organisational culture that is receptive to change and innovation.

All in all, this research wants to shed light on the emerging frontier of Generative AI, also exemplified by AI-backed tools like Runway, offering innovative short video generation on text or image commands, reshaping the landscape of creativity (Runway, 2023). The ongoing discourse concerning the impact of these large language models affect human workflows is noticeably intensifying. This is evident from the research endeavours of my peers in this program, who, through their Master's theses, have also delved into the potential applications of chatGPT. Their focus varies, with some probing its potential to boost self-regulated learning, scrutinizing the role of technology use timing on its efficiency.

Conclusively, technological tools can undoubtedly enhance production capabilities, but their effectiveness depends on the user's awareness and skill in their application. With end-user lacking the required knowledge, even the most potent technologic tools lose their value. Consequently, as artificial intelligence systems for image or video synthesis become more accurate, realistic, and controllable, the creative process will inevitably undergo significant changes as artistic creations are inherently intertwined with the tools that bring them to life. Therefore, innovative tools offer increased efficiency and the potential for new artistic currents. As such, the future of Generative AI holds vast implications for the realms of creativity and production, demanding further exploration and investigation.

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10. Appendix

10.1. Interview Overview – Screening and Scenario-based Questions

Approx.
10min

Interview Overview – Screening and Scenario-based questions

1. Do you grant permission to use the shared knowledge for research purposes for my Master's thesis?
2. Provide name, age, educational history, professional experience, industry or field of study
3. How familiar do you think you are with the subjects:

| | | | |
|--------------------|----------|--------------------|----------|
| Generative AI | (1---10) | AI | (1---10) |
| Creativity studies | (1---10) | NLP | (1---10) |
| ChatGPT | (1---10) | Conversational GAI | (1---10) |

Scenario for Enhanced (1) Divergent Thinking:

You are collaborating with a multidisciplinary team on a complex challenge: creating an innovative product line for a company specializing in consumer electronics. The project demands expertise in industrial design, product development, software engineering, and marketing. Despite the diverse skill set, the team encounters a creative roadblock and may lack the cross-disciplinary knowledge required for successful product development. To overcome this obstacle, the team decides to incorporate ChatGPT as a supplementary resource.

Approx.
17 min

- How will the engagement with ChatGPT affect the team's ability in general?
 - and to connect seemingly unrelated concepts or disciplines in the development of the product line?
- How will the interaction with ChatGPT encourage the team to consider alternative perspectives or viewpoints that might not have been considered otherwise?
- How might the team's ideation process evolve over time as they continue to use ChatGPT as a supplementary resource for future projects?

Scenario for Enhanced (2) Context Awareness:

As a creative designer, you're tasked with designing a new logo for a company's upcoming service launch. You recently discovered that ChatGPT provides you with a context-based response and could retain information of your previous interactions, which you believe will help you streamline your workflow. Your main priority is to address all the requirements provided, but you find it challenging to keep track of everything without losing focus on the creative process.

Approx.
17 min

- In what ways has ChatGPT affected your task whilst addressing the client's requirements while maintaining focus on your creative process?
- How might ChatGPT's capabilities have affected the team's ability to comprehend the bigger picture of the problem?

Scenario for (3) Real-Time Support and feedback:

You are a customer support specialist at a tech company that provides software solutions for small businesses. Your role involves assisting clients with troubleshooting issues, answering inquiries, and providing guidance on how to use the software effectively. To help you manage the high volume of support requests and provide real-time assistance to clients, your company has implemented ChatGPT Plus with its rapid response feature. The goal is to enhance the quality of support you provide while reducing response time.

Approx.
17 min

- How might ChatGPT Plus affect your ability to provide real-time support and feedback to clients compared to your previous workflow?
- Could you compare your workflow in this case with collaborating with a human colleague; how would efficiency be affected in such a case?

Conclusive wrap-up discussion: approx. 10min

10.2. Consent Form for Research Study (*GDPR compliant*)

Informed Consent Form for Participation in Research Study

Title of Research Study: Talk to the AI: The Next Frontier in Work Performance: A case study -
Investigating the Impact of conversational Generative AI on Creative Performance

Researcher: Riccardo Murciano

Affiliation: Rotterdam School of Management; MSc Business Information Management

Email: riccardo.murciano@gmail.com Mobile: +39 3496755348

Introduction:

Thank you for showing interest in my research! The purpose of this study is to gain a deeper understanding of how conversational generative artificial intelligence (cGAI) applications, such as ChatGPT, affect creative processes in various industries and how they may enhance or hinder creativity in professional settings.

Procedures:

As a participant in this study, you will be asked to participate in an interview that will last approx. 45-60 minutes, conducted via video conferencing or phone call. The interview will involve discussing your experiences and perceptions of cGAI applications in the workplace and their impact on creativity based on scenarios that I will be presenting to you. Your responses will be recorded for data analysis purposes. Please note that participating in this study is voluntary, and you may withdraw at any time without any consequences.

Confidentiality:

To ensure the protection of your privacy and confidentiality, your responses will be anonymised, and any personally identifiable information will be removed from the study results. The findings of this research may be published in academic journals or presented at conferences, but your identity will not be disclosed.

Consent:

By signing this consent form, you acknowledge and agree to the following:

1. You have read and understood the information provided above, including the purpose of the study, the procedures involved, and the confidentiality of your participation.
2. You have had the opportunity to ask questions about the study.
3. You voluntarily agree to participate in the research study.
4. You understand that your participation is confidential and that your identity will not be disclosed.
5. You are aware that you may withdraw from the study at any time without any consequences.

If you have any questions or concerns about the study or your participation, please feel free to contact the researcher at riccardo.murciano@gmail.com or +39 3496755348. If you have any concerns about the ethical conduct of this study, you may contact ethics@eur.nl.

Please sign and date below to indicate your consent to participate in this study.

Participant's Name: **[Participant name]**

Participant's Signature

Date

Thank you for your time and consideration in participating in this research study.

Sincerely,
Riccardo Murciano

Riccardo Murciano

Rotterdam School of Management – Erasmus University Rotterdam
MSc Business Information Management

10.3. Interview transcripts

As a disclaimer I want to point out that these interview transcripts presented herein do not encapsulate the entirety of the dialogue conducted with each participant. Rather, they reflect the stages subsequent to the screening procedure. This approach has been adopted as the conversion of all discussions into textual format appears to be of minimal significance, especially in light of Figure 11, providing a comprehensive overview of each Sub-Cases' expertise.

ID_1:

Riccardo: We can start with the first scenario. Then I can read it out for you real quick. So imagine you are collaborating with a multidisciplinary team on a complex challenge creating a an innovative product line for a company specializing in consumer electronics. The project demands expertise in industrial design, product development, software, engineering and marketing. Despite the diver, there were skill sets the team encounters a creative roadblock and may like in cross-disciplinary knowledge, required for a successful product development. So to come this obstacle they team decides to incorporate chat as a supplementary resource. So it's basically a team that has to solve a problem which touches upon many disciplines. and they decide to go with to overcome this creative roadblock they encountered at some point. So first of all, how do you think engaging with Hvt. Affects the team ability in in general? And then we can talk more about the rest. But in general, how do you think

id_1 : So I imagine that the the first thing that this team would do in using ChatGPT IN problem solving in in this scenario would be to fill their knowledge gaps, in some parts where they are not so knowledgeable as they would like. So I think that the the first impact that ChatGPT might have in in this scenario would be to help the team cover, some of the knowledge gaps that they have in order to to proceed in problem solving, so they might, for example ask of the industrial design that they are not so knowledgeable about, and then move to the product development, and and so on depending on on the expertise of the team that would be, I would imagine, would be the the first step. Then, when they are maybe more advanced in this problem, solving when they already have a framework to solve this problem, they might use the system to brainstorm, probably on more original solutions that they didn't think about like they could then feed the system with the plan that they already have developed and ask ChatGPT for something that they overlooked, or or some some other kinds of input. And yes, since you said, maybe to the to integrate with with personal experiences. That's also how I use it. Of course i'm not producing anything concrete like as a product but I find it particularly useful to use in the in the stage of structuring an argument for a talk. For example, I first brainstorm and and then I feed ChatGPT with the plan that I have, and ask "Should I structure it differently? Or should I integrate it with something else? And that's how we use it as well. Yeah.

Riccardo : So in this case, how do you think using it could affect the ability to connect seemingly unrelated topics or concepts or disciplines in this case, in the development of the product line, when also thinking about what generative AI even is.

id_1 : Yeah. One of the aspects in which AI in general, and generative AI specifically, it's very good that is, finding patterns and and finding correlations, which is something that we assume. And humans are quite limited in doing, and which is one of the first signs of creativity. So yeah, that's

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the the combinatorial creativity that Margaret Bold and talks about is something that these systems excel at doing so I I get this in the impact that the use of chatGPT would have in this respect is is quite high. just because it's able, like in this specific scenario. Here it's able, maybe, to connect some aspects of industrial design that can be sold through software engineering solutions the team they didn't think about just because one single individual doesn't have the full picture. It's just many different individuals. So that's something that they, I think, could have a high impact. One thing, of course, to be aware of is this hallucination bias so. But but in this case, where there is a team of experts in every single discipline, I think it will be easy, then, to double, check and see what if this is what the system says makes sense or not

Riccardo : You also answered the second question with this response of yours. So maybe if we were to think more into the future.

Riccardo : how do you think the team's ideation process would then evolve while still using such a vt as a supplementary resource.

id_1 : The first thing that comes to my mind would be that, let's say the the team as with the help of as come to solution for this product development. The the first thing that I would do if I were in this team would be to narrate this product development to the system and and ask the system other possible applications of this solution in in other domains and that that's something that I think would be both something feasible for the system, just because it has knowledge of other domains that the team doesn't have and also something that would be quite valuable but also, maybe in terms of marketing like how to market the product to different audiences and target these audiences in a different way would be a possible evolution of the use of the system.

Riccardo : Oh, interesting! Alright. Let me think. In this scenario. Can you think of any other aspects that could help them out in doing?

id_1 : Probably, I mean, thinking also my experience to like. I working very interdisciplinary teams and topics just because of the nature of my research. And one of the main issues that especially at the very early stage we encountered is to find both a common ground on the terminology that we use. And that's something that maybe this system could help teams in doing it, maybe having just a list of the the key words that we will be using for a project and and agree on them. And the other one is to find a way to keep track of the progress in the project, because we all use normally different systems. For example, before joining more engineering or more scientific groups. As a philosophy, I didn't use just to make an example. I didn't use overly for slack, because in in philosophy it's not so common to have large teams. But that's something that I integrated in in my in my research, and that works well for me as well. So maybe another way to use this system would be to suggest possible instruments to keep track of the progress of the project.

Riccardo: Perfect, thank you for your input. Over to the next scenario. So in this case you imagine you are a creative designer, and you test with designing a new logo for a company's upcoming service launch. You recently discovered that chatGPT. Provides a you with a context based response. and could retain information. For of your previous interaction.

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Riccardo : which you believe will help you. You streamline your workflow. you may. Your main priority, though, is to address all requirements that are being provided to you. But you find it challenging to keep track of every requirement without losing focus on your creative process. So, with this feature. How do you think it could affect your your task while still addressing the requirements and maintaining focus on your crazy process.

id_1: That's that. Yeah, that's a good to think about. Well, again, in the in the view of using the systems as an integration, as you were saying, and not as a substitution of the human side. I would come in in this kind of scenario, try to delegate to the system all the tasks that pertain to, maybe having an overview on on this requirements, and maybe summarizing them in a way that is more compact and easy to to to keep track of, because it might happen that the the client is is giving you some, or or that you have different clients with different requirements, and you need to have them set up in a manageable way, so that they are always on your mind when thinking of the more creative side of the of the project, so I would use to help me extract the medical key requirements and and suggest possible ways to address them, but at the same time keeping playing this way in to the human side, the more creative process. So again using it as a purely the delegating, the the most boring part of the process which would be summarization and highlight of the key points.

Riccardo: And if we were to think about it as your companion like right you, you you use it throughout the whole workflow. And if you were like, now you focused on the summarizing capability of it, which is good, and I would like to to elaborate, maybe more on the fact that it's able to remember your prompts. So this ability of to also yeah, remember what what you asked him, or what you told him. Do you think that can be connected with the keeping track of the requirements, this capability itself?

id_1 : Well, it it can be in the sense that also, through that the creative process it might be that, like in in developing the in the development of the process itself, for the way in which the human mind is made, you might also change your your thinking and forget what the original point you started with was just because you're going with the flow of your creative process, and then you lose track of what was the original AIM? So in that sense it would be yeah, very good, too. And then I I just was just reading today that they extended the the cup memory, capability of ChatGPT. And now that you can remember, yeah, a lot more. So that that would be extremely useful. Because then you can say, you know, like. So let's stop here for a minute. I'm not sure. I'm really following my initial AIM. Can you remember me what it was, and whether i'm on track.

Riccardo : all right. So we agree on the fact that it's a good at the let's say, keeping the the bigger picture and trying to. Not that that should go off track right with with your requirements. All right. That's good.

id_1 : in regards to this. Yeah, yeah. But the the effectiveness of the decision making process. So I remember that when I first started working on on this systems, when ChatGPT generative adversarial networks came out, what one of the things that was particularly striking to me in respect to maybe previous systems of music generation in case of creativity, was that this new system said this a evaluative capacity within themselves. So in GANs it was the the fact that the 2 rival models inside the ChatGPT model were physically evaluating the performance of each other. And that's something that we, as humans, do with ourselves in the creative process or with others.

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If we work in teams so that the evaluation part of is is a key aspect of creativity, and evaluating if the output that we produced was the one that really reflects the originally aims And so this system here, especially with the improved memory, can can also work as a kind of extension of this evaluative capacity. So and and this massively improves the the effectiveness, especially in this kind of more streamlined, creative processes, where you have to produce something at the end that reflects the original requirements, because it guides the process without the biases that we ourselves have with ourselves, so like.. It happens to me that when I I start with a project and I read it, I can idea. I try to convince myself that that idea corresponds to my original aim, even if it doesn't, just because I like the idea. But this is, since instead can can work as a kind of extended self without this bias. Yes, then they have their own biases, of course, but maybe they don't have this kind of bias of confirmation bias that what you say is reflects the original aim.

Riccardo : Okay, I mean, this is clear also. So we can already go on our number 3: you are a customer support specialist at the tech company that provides software solutions for small businesses. Your role involves assisting clients. So with troubleshooting issues, answering inquiries and providing guidance on how to use the software effectively to help you manage the high volume of support requests and provide real time assistance to clients. Your company has implemented chatGPT plus with its rapid response feature. ChatGPT'S goal is to enhance the quality of support you You provide while also reducing response time. So I, I would like you to reflect on how ChatGPT might have affected your ability to provide real time, support and feedback to clients

id_1 : Nice. So Well.he the first, the the most obvious impact, would be that. Of course it takes less time, and and to maybe to give assistance to to more customers. At the same time, just because most part of the support that I I guess the specialist would would receive requests for is is the same. Maybe there is a a specific aspect of the software that is not particularly user friendly that many people ask for. So just adding that response that is already embedded into the the system and the ChatGPT just because it remembers what you previously said. Maybe it streamlines giving the same reply to to more customers. so that that that would be, yeah, but that's something that maybe also other kinds of software before ChatGPT. So yeah, that that's not something that ChatGPT would be yeah better than OTHERS.

Riccardo : And then maybe a consider. Because before you were talking about the evaluation process, so try to envision ChatGPT here as a and then other agent that helps you evaluate through like iterative feedbacks, your service to the client. So let's say you come up with a solution but you're not sure of it. Or, yeah, you want to evaluate your solution before providing it to the client, and with this rapid ability of you want to have real time feedback on it. yeah, elaborate.

id_1: So maybe the I I it would be in this case. The the impact of ChatGPT would go into directions. The first direction, which is the more technical one: So the the customer asks you for support, you consult with ChatGPT on what the answer should be, also from a technical point of view, asking, If so, i'm going to say this, do you think it's correct? And then this back and forth with ChatGPT Then you give the answer to the customer, and the customer gives you a feedback, and then include this feedback to ChatGPT. And through this improved memory of the system, you can go back and see for the same kind

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of request of support, or similar one in the past, giving maybe a different kind of answer or a different, it. Yeah. Highlighting a different aspect of the troubleshooting had a different impact on the feedback received from the customer. But also from a more empathic aspect: Thanks to the capability of the systems to change also the tone of your pros, You can also give different different answers to different kinds of customers, also from just from a purely linguistic point of view. Like maybe there is. The customer wants a a short and very direct reply. Another one, instead needs more guidance and a bit more empathic tone because they are stressed out, and they want to troubleshoot fast. And so maybe that's another application of ChatGPT

Riccardo : and let's say, before the implementation of they used to be a colleague of yours, helping you out with providing these solutions. How would you compare than your workflow with with the one with ChatGPT now like before with your colleague. And now ChatGPT, because I don't know the colleague. Your colleague got moved to another department by higher management.

id_1 : Well I imagine that would be better in in this memory, and that they, and quicker because then you buy tasks for your colleagues. 2 weeks ago there was that client to ask the space, and then yes, maybe your colleague as the file, but then they need to go and access it and greet it. And yes, now I remember and go back to it. So it improves the for sure the speed and with that also the efficiency. I don't know maybe the on the other side. So from the the next, so, and this would be a a plus a positive aspect of ChatGPT in respect to you, my colleague. From then maybe the negative side, and this I i'm referring now to the to my experience with the current state of the arts, then it it might and it will change. But but what a ChatGPT tends to do is always to to say that you are right even when you're not to excuse and to say, sorry for something and it can have negative impact on on the effectiveness. Because then there there, yeah, exactly. Then when you're doing correct, which is inside something that your colleague might be able to say and to confront you with.

Riccardo : And if you were to think about this aspect more specific on the iterative feedback aspect.

id_1 : You mean, if the like teaching basically teaching the ChatGPT in giving you feedback, that is more Critical or like having a back and forth. So yes, the teaching the system to be more critical. Well, I don't know if it's possible. I guess it it will be again, as as the system is able to change also the tone it rephrases the the pros. It might also be able to to learn to be more critical, and and point at your mistakes. But the iterative feedback, we with yourselves, using your ChatGPT. As a as an extension of yourself. It's more efficient with ChatGPT than with a human, just because you it's quicker, and you don't have all the problems with the em embodiment and the weaknesses that we humans must have provided that. Yes, that that we we solve this issue, that now this system has a tend to always say that you're right. That's crucial.

Riccardo : Yeah, because they want to also find the the best answer for you, right? And most of the time it has to be positive.

id_1 : I don't see it as possible to to to improve in the near future

Riccardo : and have you like in your experience. Have you ever used it as your let's say, critical companion?

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id_1 : Yes, so when, like I I i'm preparing now for a talk which is on a topic that is it's yes, it's partly what I'm i'm researching about, but also part of the talk would be on something that i'm not an expert on. So I i'm using it to fill this gaps in within the argument and they did a lot of back and forth to develop the the structure of the argument. And it worked well at at an initial stage, just when brainstorming and and having an overview on on the things that were yeah, that I should cover. But I found an impasse when it was saying something that was blatantly wrong, and I kept telling him, okay, no, sorry. This is wrong, and just please try to rephrase and to say something. And it kept apologizing. But again it it was continuing to hallucinate basically singer. Yes, you're right. I was wrong. And then it was saying something else. But again it was wrong. Without maybe challenging things. No, look. I think that you are seeing this wrong in this particular case, because the argument should go in this way. I would have preferred it. Yeah, to challenge me. Instead of apologizing and trying to rephrase it in a way that was still not.

Riccardo: And maybe if you prompt it right, but you always need to. And be very explicit about it.

id_1 : yeah, exactly that that's something that yeah. So I I learned that you you gain. And I also tried it, and it works that if you

id_1 : prompted at the beginning, trying to explain what their role as ChatGPT should be. Then it gives you better answers like, if you say the beginning. Okay, so you are a super critical boss, and that always tries to find the wrong thing, what they say. And then you start prompting it with what you want to know, then it works better.

Riccardo : I mean I have some sense here in the the capability of ChatGPT Plus, the one that you're considering to take, because it's a it's very fast. So this, maybe like, if you are in a creative process, at least tell me if i'm wrong. I would assume that if if your focused on your on your creative process, and you you want to have like the least amount of time possible. And waiting for something and seeing. Yeah, just putting your mind on which I assume could happen with another human. and will not happen with a machine that immediately gives you the response of feedback. Right?

id_1 : Yeah.

Riccardo : All right. I mean, technically, the scenario is already done. I didn't expect it to go so quickly. But yeah, if you do, you have anything that you you feel like adding, and that I didn't ask you to know, like any, any any thought that popped up while we were talking, and you were like, yeah, maybe I tell him later.

id_1 : Well, maybe in general. So this all 3 scenarios. We're mostly focusing on this decision making and problem solving processes. That's that's where yet it in that developing yes, a a product or or a quite a concrete outcome. What I I've started thinking and working on is how best to teach people how to use these systems, especially also in an education setting. So this idea of, for example, in more in the education setting, but a varying watermarks that are able to distinguish between what is the outcome? What is the product of the human involved in the process. And what is the instead that the the product of of the system that are starting to be developed. I don't think it's in the long run it's something that is feasible. And just because of

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how integrated these systems are. and if, if, instead, we should start thinking of having different kinds of systems rather than preventing people from using it or highlighting Exactly what was the output of the human? What was the output of of the model. What can be another way in which, instead. we allow the use of this systems, and we all agree that their use is acceptable and and correct, just as we we allow students, and we allow people to use calculators without seeing anything wrong with it. because it's not a calculator, of course, but I feel that, yeah, continuing along the line: blocking the systems and preventing their use is not going to work.

Riccardo : And from the all the aspects that we talked about in this interview, Which one, do you think is the aspect or the element that is affected the most, maybe not necessarily enhanced or inhibited, but more like affected by ChatGPT, like you do the use of a conversation or a generative AI? Like what aspects of the creative process in your right now.

id_1 : So, from a first first person, perspective the the most straightforward and boring ones. So basically the ones where you already have an argument For example, you're already at I'm always talking about the arguments and and linguistic stuff, because it's yeah, that's mostly my, that my creative output, which is the argument and to develop. So when you already have a an argument, maybe in bullet points. So you already have everything. You have the premise you have, how it should proceed, and the conclusion, just giving it to the system in bullet points, and asking it to rephrase it as a more organic text. And the same goes for communication like you have to write teammates or reports, and you have the structure. You have all the content. It's there. Especially for for someone who is not whose native language is not English at that, as the the most of this impact in my experience and those in the experience of the colleagues that are using it. I mean. I don't know pretty much anyone who is not using tragedy to this in this kind of tasks now. So that that has had a a a big impact and an impact that I personally speaking, I don't see anything wrong with, because if you already have the argument, if you already have the content, just ask you to support you in a way that is appropriate for an email or a report, I don't see an infringement of any.

Riccardo: And do you think there's any threats in the in the creative process as in? And that maybe it's a tool that people would tend to abuse for of, or it's, or maybe that people are less incentivised to think in a critical creative way. Or maybe. Do you imagine such scenario?

id_1 : Yeah, no, that that's for for sure, because it takes away the the effort, which is a a relevant part of the creative process. Just get sitting there and and thinking hard is is something that also develops creativity, and that we we might risk losing it. That's why I was saying that once you already have all the content of your creative process, and you use this system just to to integrate it, and then put it in a form that is apt for a certain piece of writing that you want to to produce. Then it it might be okay to to use it as a tool to support you. But yes, there is the risk of just yeah, taking the easiest way and sitting down and say, okay. So I want to write an argument regarding this topic. Can you suggest me some. and that that's a huge risk. Both? Yes, both because it's it's still a losing it's quite a lot. And so it might say something that is completely wrong, but also from a more human point of view, it's taking away the effort, but instead, that should be going into a creative process. So yeah, it's a it's a tricky balance. But we have to quickly think of a way to integrate.

Riccardo : like, understand the technology well.

ID_2

Riccardo : Imagine you're collaborating with a multidisciplinary team on a complex challenge, and that is to create an innovative product line for a company specializing in consumer electronics. The project demands the expertise in industrial design, product development, software engineering and marketing. Despite the diverse skill, set the team encounters a creative world block, and may, like the cross, the disciplinary knowledge required for a successful product development. So to overcome this obstacle. The team decides to incorporate ChatGPT as a supplementary resource. So first of all, I want you to reflect on how engaging with ChatGPT in this case WOULD affect the team's ability in general, and then how they can. Yeah. And then we can go on with the conversation.

id_2: Well. First of all, I think that engaging with ChatGPT is. I will start with this my opinion about ChatGPT, which is that it's basically a very powerful next word generator and nothing not so much more. It I mean, it's a very hard. It's very a hard opinion and it's debatable for sure. But in the end, what this tool does is a very accurate next for generation according to the distribution of language, the probability, distribution of the language. This is what does, so it can help for sure, in generating text and this is something that I use it for a lot. So, for example, generating text for slides or proposals for clients, emails. When i'm tired of something that is something that use it for. about the so something, maybe in the middle, between plain text generation and very creative work, as something that you point out here is generating code. which is something that I think I tried it and I am not so a super fan of it. So there are people there are developers who are proficient in using, and all these other generative AI tools for coding. But these for me they don't really work. Maybe it's it's me. Probably it's me that I don't put in the effort, but I found it goes a bit off from what I may mean for you to to go. What I think it can help here with is just throwing out ideas. because this is something that it does very well. So if you want to generate a text about something very. For example: Tell me how important is the banana inside the a banking portfolio for credit, risk something completely? Nonsense! And ChatGPT generated a whole text about how the banana could be important to create trees. So it can be a good way to explore new possibilities and throughout ideas which is something that maybe could be a bit difficult when you are when you're tired, for example, to do something like that. But then it's up to the it's up to the team, to the humans to decide what to do with these ideas. For example, I used it. I used the a lot for use case generation, and a few weeks ago because they wanted to build a slide deck with a lot of use cases for AI for different industries, and I use the ChatGPT I mean generates this use case so it can be very, very effective for that. But still it must be treated with the grain of salt. So I don't know if this is this, or we can.

Riccardo: We can have more discussion about it, but it does for the moment. So when you, when you see, create a creation of new ideas, how do you think it can handle it when they're small, more subjects, more disciplines that are in the problem that you there you're trying to solve. So in this case it's industrial design prior to the help and software engineering. Do you think it performs better with more more disciplines, it performs better with

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just with one? What do you think when it comes to idea? Generation like you said.

id_2: I think it performs better with a single... I mean, I think, that prompt, prompt engineering and basically interaction with the lens works best when the prompt is super precise and super accurate. And this is something that I also... I'm, following a course about the prompt and prompt engineering irrigated by my OpenAI, and they told us the same thing. So the more the more accurate the prompt is the better the answer. It would be so I guess that also having one, only one having a very narrow area for it to generate ideas. it can. Yeah, it can go a bit deeper, probably, in the subject.

Riccardo: So you would think it's not excellent at connecting seemingly unrelated concepts, so it's better at focusing on one and not connecting these right.

id_2: It's hard to say, actually, because it's very much in the you and it the unexplored the technology, and it's also very hard to start.

Riccardo: My AIM is to find out your perception. So from what you gathered like we don't have to go super technical into what actually is. But it's more about your perception as a as an expert that is using this technology.

id_2: yeah, I would think, yeah, I would say, yes. Because they are especially the new one and the new GPT-4 model. Is, it is very good at making arguments like producing articulation in the answer, and then nuanced responses, so it can. Also it can be that it can reason, you know as well as can reason. If you think about the like, the blogpost that you open a I released for Gpt 4, I don't know if you followed it. Basically it's the same. They give the models inputs an image, and with one kid with bottles and say, and in the prompt with text, what will happen if I cut the strings of the balloons my way, you know so it can. It can reason, especially the new models. No, I think that it can. It can work. It's very hard to say. I don't have an answer to this one.

Riccardo : Makes sense, no worries.

Riccardo : Then, yeah, Second, I wanted to further develop on is how this interaction, which actually would encourage the team to consider alternative perspective or viewpoints that might have not been considered otherwise without the use of it. So I always thinking about this problem that they're trying to solve.

id_2: I think it could be a good way to explore new perspectives. But the problem here I think that would be: First, These people this team will need to very precisely to find the prompt, what to ask the model. and this this also.

Riccardo: Also Sorry, little little thing. Maybe I should have made it clear before, because I you already do think, probably drifting probably in this direction. In this case ChatGPT is not being seen as a tool to make the job of the team, but to and like in that affecting the job, or like using it as a tool. So it's never about how the machine is able to perform this thing and in specific, but how it affects the creative process.

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id_2: Yeah, for example I think... many, many people here in my office use very much, much more than I do. I have this. This guy sits next to me, and he uses it all the time. So maybe it's just that I am not so... maybe since I know how these models work. I'm not so confident in using them in my everyday work, and I prefer I'm. I'm faster in thinking rather than thinking how to prompt the model. So I'm faster doing the job right away rather than thinking, okay, how can I ask ChatGPT in your way make sense that we do it? So it can be. I think that the second question is very on point, because it can help in generating new ideas. And it is something that I use for. So Basically, when you're out of ideas, you say you, you ask ChatGPT, and the model answers you with new ideas. Maybe some of them are random. As I told you before, maybe some of them are not. So it's basically Queering. we mentioned that you have a model. These models are trained on millions and billions of tokens of words coming from the Internet so they crawl all the web, and they train these models for millions of hours. Probably, you know, if they, if you convert it to a single machine. But they're doing parallel so they can. They have knowledge which is something that a single human can never have. So it can be useful to generate new ideas for sure.

Riccardo : awesome, awesome. And yeah. to conclude, how do you think over time? So, after an iterative use of it, ChatGPT would have influenced the ideation process like, Think of it as in a supplementary resource for future projects. like all the time. Do you think it is, it would be better? Do you think that the team would perform better, and before and in the long run, maybe why...

id_2: The thing is that you need someone who is very good in his job or her job to overcome these, this technical roadblocks and ChatGPT can never perform these tasks autonomously. So it can be a good tool, a useful tool for exploring new ideas. But I mean, as you AIM. Guess from what I said, since the beginning I'm. I'm not super big of a fan of ChatGPT, the of using it as a tool for work. I think that's the most important usage, for it is when you want to generate text and generate ideas, yes, but with some some caveats.

Riccardo : Let's go to the next scenario. and this one you imagine you are a creative designer. Your task and graphic designer, or whatever you want your task with designing a new logo for a company's upcoming service for launch. You recently discovered that ChatGPT provides you with a context based response and could retain information of your previous interactions, which you believe will help you streamline your workflow. Your main priority is to address the requirements provided, but you find it challenging to keep track of everything without losing focus on your creative process. So in this case I want you to reflect on how ChatGPT will affect your task while still addressing the clients requirements and maintaining a focus on your creative process. So you have a lot of requirements You have some requirements that you really need to like. Think about. But if you, if you continue to think about the requirements or restrictions, limitations, and how to make the logo, for instance, what colors can be used and not. and you name it. You might lose focus on actually like being a creative yourself to think outside of box, maybe, and so on and forth. So chat, chpt provides these 2. I say capabilities of first providing a context based response, when when you prompt and retaining information on what you said before, you know the conversational aspect, I don't know if you use it yourself. This this capability of ChatGPT, that it remembers what you wrote before. But I want you to. Yeah focus on these capabilities in this case.

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id_2: yeah, the thing about memory in this model is that they have their memory is still limited at least for Gpt. 3.5 it. I think it's 4,000 tokens, so something like that, and it was expanded, and up to 30,000 to 40,000 tokens in GPT-4. I so. This is the most tokens that the model can handle in a single shot, and it also I think that ChatGPT IN the conversational aspect, of course, I don't know how it works, but I think that it works that basically you have this big model. And you say, okay, this is the history of the chat, and you you paste Question, answer, question answer, question.. You say this the new question, what's the answer, and the model can have, so 3.5 has a context of 4,000 tokens, and can look in the history up until 4,000 tokens and GPT 4 can expand into 32,000. So this is how the memory works, and I mean, i'm not sure. Maybe they embed it in some way. But if you, if we think about it in a plain way, this is how I will do it very raw a way of designing his memory. So I don't know. Using this as a memory for requirements. I'm not sure how you would do it, because if these requirements are very important, then... so another thing. You cannot trust these models in having memory about what they say. Okay, they can remember some things, but they are. They are not like having a member.

Riccardo: So it's like having a degree of error

id_2: Yeah, but it's not like having a memory in the computer where you say, okay, in this we have this string and this other for this other string, and you can clear the others. It's very much embedded. So you have every token has an embedding which is a vector in a big mathematical space. And then you do all sorts of mathematical operations on these vectors. So these results in the model having memory. But the model is not instructed to have memory, so it's a it's a consequence of it.

Riccardo: So yeah, you you don't really envision it how to use it. Well, I think of: You need to design a logo about a organization that is saving foxes, and in a forest and the requirements are very reliably the fox cannot be green, the the logo cannot be of a certain size. I cannot show this kind of shape. so you list all the requirements you put them in and into the chat, and then you continue using chat as your tool. So the point here is how good is it to keep you focused on what you're doing, but having the big picture of what you were actually like to do? So maybe asking for more suggestions on how to proceed with the design.

Riccardo: Maybe like a image generation tool, something like that. Also, I mean, in this case I want you to focus on the conversational GAI. So it's mainly text. and and having having a conversation with it.

id_2: No, but it it can help it can help it's it always depends on the prompt. So you have to very to be very proficient in prompt engineering. This is something that I found out on my own. So I tried. I'm starting this project with a client and we want to generate new images and new texts. And of course I said, Yes, okay, let's try, but it's not easy to to prompt the smallest in a in a way that they answer your request very specifically. I think that if you're a good prompt engineer. Then with these models you can do it. Maybe in the future they will build new models that align better with what the human wants, because I don't know if with your experience with this model. So what happens is that first they build the base model, which is a transformer. Basically and this is a model that does next work completion. Just that. So this is what I said before about next. For generation the most likely words given the context. And then, after building this model, they fine tune the models with a technique called reinforcement learning with you

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and feedback. And this is done by yeah, basically comparing the output of the model for a single prompt with the human response and people raised the responses and they train the models again with this, this with these pairs. And this is the technique that helps in order to align better to what the humans want. So the and is a very, very big problem for for these models and they have very smart people working on it. So maybe in the in the future. We we have models which can align a lot better to what we see. But right now at least I find it quite hard and time consuming to interact with them.

Riccardo : I see. Have you ever used it to like, fulfill a task or solve a problem and using it to make sure you're not going off grid, and you keep, let's say the general picture. So you you don't lose focus on your thing and specific.

id_2: No, not really.I used it for... it can help to to generate new ideas, and also these ideas. It it can help giving you a fresh view on something else. But it's it's not so fresh if you know what I mean, because it's a anyway, something that it's coming out of the Internet in some way. So it's not like talking to a new to a person and interacting with a person. It can can give some of them good ideas. And it can also take into account these requirements that you, your envision in this scenario... but it as far as the models we have now. I wouldn't trust them much.

Riccardo: Okay, so it doesn't. It's not really worth for you.

id_2: It's maybe it's that I'm not super fun of it. But there are people who that who use them a lot more than I do. So it it's. I think it's very much personal

Riccardo: to provide you, maybe with an example. Let's say you had a whole chat with all requirements, and so on and forth about your your problem that you're trying to solve your logo that you're designing. and then you give a prompt of all right this whole conversation let me come up with how and design our Xyz super famous designer, would have criticized this process. How how do you think this task is being managed by?

id_2: yeah, I think it can that answer pretty well.

Riccardo : The the capability here that I want to analyze is the his ability to keep the general picture and not let letting you drift off your creative process too much. So basically giving you context. Yeah the the ability of it to to provide context. And you say it's not really worth it. I mean, of course, because of the technical aspect of it, not being able to remember properly that Well, so it's a matter of chances because it's better at a generating idea, right?

id_2: Yes exactly, we're on track on this one

Riccardo : I mean, check on this. Yeah, okay, I think

Riccardo: Okay. So here you imagine you are a customer, support specialist, a a again. Also here. If you don't mind that is not being used to replace the the desk, that you in this case are doing. But it's more on how it adds on your your task, how you use it for complete completing this task. So yeah, you are a customer support specialists at the tech company that provides software solutions for small businesses. You can also reflect it on your on your own consultancy expertise. Your role involves assisting clients with

troubleshooting issues, answering inquiries and providing guidance on how to use the software effectively

to help you manage the high volume of support requests and provide real-time assistance to clients. Riccardo : Your company has implemented ChatGPT Plus with it's rapid response, Feature. The goal is to enhance the quality of support you provide while reducing response time. Think of such a GPT 3.5, right? The super fast responders. And yeah, how do you think Treasury team might have affected your ability to provide this real time support and feedback to clients compared to a previous workflow Without it.

id_2: I think this is the killer use case, It's the most important them the the use case where it will have one of them biggest impact. So this is for sure big ability of. I don't know ChatGPT Plus thing. What's the difference?

Riccardo: In this context ChatGPT Plus capability is the capability to spit out the answer at super high speed, like almost as fast Google or very close.

id_2: Okay, okay. No. I yeah, sure. Even with the normal ChatGPT, this is something that companies still don't have, they support, I mean, for for example, this morning I called the support of Dell, because I had problems with an order I I made. I wait to 30 min on the phone, the pressing, the first 9 and then saying, Customer support, and they I don't understand.. so it's something that even big companies nowadays don't have the ability of answering. This is a very important use case for, because you see that it's not it doesn't need to give you new ideas to give you. The reason just needs to answer your question asI mean, if a human with little or no intelligence, you know it's, it's not required to have high intelligence to answer this kind of questions. So this is something that probably customer support will be completely replaced by ChatGPT.

Riccardo: And I mean in in this case. In this case it's more about not like how how it replaces it, because that's that's another type of discussion. But how it would help you and providing a better quality feedback, maybe because in this case it's not just a a call center. Let's say it's. It's more about finding a a solution to the problem of the client and tailor it's to be more specific. So it's basically it. The the point is you'll have access to ChatGPT plus while you assist the clients.

id_2: I understand there are. There are some companies that do this, o something similar. I mean, maybe you know them. They are called Minerva. And then you do something similar. So basically there is the the human answering the phone and they like. The call is recorded, and it's connected to an AI and the AI provides suggestions from the customer. The knowledge, base and provides the intent of the person, so it helps the the support specialists to do their job better, and to to answer more effectively, and in the end probably to answer the questions better to provide better quality. That's for sure. Better quality. rest, shorter response, time. I don't know, not so sure about it. Because in the end. Even so, when you are when you call this customer support the interactions are usually pretty short, I think, and they are very precisely directed at what you want, so I don't think they can be reduced that much. Maybe ChatGPT could help the support specialists to have to answer, to get what the other person is asking faster. So first of all, maybe, instead of asking me, okay, what's your order number or I don't know. Like, instead of asking you something, they with me like with me talking and connecting my number with my voice they could already have on their screen what I want, instead of asking me so this could reduce the time. And yeah, instead of them looking in the customer base for ways how they could answer

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my question, they just have them on their screen directly, because the the call is connected to a in charge of it, team, model, or something like this. So yes it can help.

Riccardo : All right. If you were to think more actually using it for providing the the service, you can use it for evaluating. Let's say multiple. Let's let's take away a little bit of time pressure of being a support specialist, and think about providing the best, the best option for the client. In that case, do. Would you envision a good performance in having sort of a feedback looping in the conversational aspect of ChatGPT so let's say you, you, You've thought about the option, and maybe you ask for feedback for the to the AI and then maybe there, there's the process involving that. How do you think that could affect your creative process?

id_2: It can work. I see many people doing doing this. Personally. I don't do it. So you already told you, because it's not. It's not how I like to reason.. First of all, I don't trust the answer. I wouldn't trust the answer that much and second, it will take me a lot to come up with the prompt, which is effective for that. But I see many people do it, so it's probably just me that i'm a bit skeptical.

Riccardo : No, it could also be small prompts to let's say further, dig into the better option that you are considering in your head right, it can also be just an...

id_2: Yeah, but I would prefer either looking up on the Internet for articles. Maybe I mean, in the end, right, you can find basically everything. So you can find an article, you can find...

Riccardo: It cannot provide feedback on your idea.

id_2: You provide your feedback on your own, though you can reason. or you have some teammates to resume it.

Riccardo : That's that's that's exactly where I what I wanted to get. Because think about yeah, having a teammate right now that you use to have as critical thinker. So imagine you are now collaborating with the human colleague for this, for this task, or in in one of your tests in your experience. How would it compare to aChatGPT team mate? For

id_2: I think with ChatGPT 3.5, which is the one I use is like having a not so smart teammate. So medium teammate, so somebody that you trust a little bit. Not so much. Which can can you get some ideas? But you still have to be aware of checking what they say, especially for I think about code. But this is the same with also with this conversational aspect. I heard that ChatGPT 4 is better. With coming up with reasoning and the more complex ideas. But then still... it's just all the ideas regurgitated and put together. That's what it does.

Riccardo: I see. So you would prefer a human colleague.

id_2: Yeah, for sure.

Riccardo: And if you, if you were to compare on what capabilities a human would would outperform on or outperform. Or, yeah, just be better then. So we agreed so expertise and trust, maybe any other aspect?

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id_2: You can ask the model a chat ChatGPT To explain to you how they came up with the decision or with an idea. But then you're not so sure whether... So you don't know if the model really is and understands what he's saying or it's just it's just a very sophisticated way of generating the next word. So

Riccardo: that's where you lose trust.

id_2: Yeah, because with a human you can understand how they took how the reasons behind the decision. Because maybe you don't agree with the decision. But still you can argue with them, and maybe they can convince you.

Riccardo: Yeah, if you, if you were to compare it to the feedback looping. So basically having someone that that always sort of puts a critical viewpoint. If you were to compare it on this aspect. the both.

id_2: Yeah, It can help to have... Okay, if you're on your own, I mean for me especially, I work on my own most of the time. If I would have a model like GPT 4, which is here, it's very provides very complex answers and very nuanced answers. So if I would have something like that and if I had the problem I could, I could chat with it and ask him to challenge my reasoning, for example. and then trust myself to understand there is a. So I asked ChatGPT: If the okay challenge this reason and change it to take comes up with 5 ways to challenge my reasoning and then it's up to me to accept them or not. This is something I will do.

Riccardo: And if you would compare it to your teammate. What aspects could be better or worse? Trust is better as a human. But maybe something else.

id_2: Trust is better. Maybe something else is worse. I don't know just to get a general overview. Explainability which goes in the same direction of trust, which probably it's good point. So you don't know how human function anyway. And so you cannot. Okay, you don't know how human functions either way. So maybe it's the same. You're not. Humans are not explainable as well if you compare them.

Riccardo: But maybe you may be thinking about time / consumption.

id_2: Yeah, time. No okay. Knowledge, ChatGPT can draw from it much bigger knowledge base than a human. But we can talk about width of knowledge and depth of knowledge. ChatGPT is very wide. Knows a lot of things from all of the Internet. But a human is, if you talk with a big expert of a field, the human, then he would know much more than ChatGPT so, more deep but maybe less wide.

Riccardo : And on in the long term, how would that affect your ability to provide a nice assistance?

id_2: yeah, it depends. It depends on the task. So if the task is very, it is very precise, like, for example, coding. If you think about coding. I already told you. I don't trust they tried it, and I didn't really like it, so I would prefer having a human teammate to assist me with coding. But then, if it's a very simple task, like, where's my order? Where is Why didn't I get the refund for this claim, or something like that, and it's more than enough having a large language model to answer that. But the more complex the question is the more likely it is that it's better to have a human to support you.

Riccardo : Yeah, sure. So overall in this scenario we would say that you yourself don't really use that as your let's say, creative assistant, as like a an enhancer of creative thought, or someone that criticises your work, right? It's it's more of a: "I take the knowledge from you, more than using him him as a critical thinker on your on your work. Right?

id_2: One thing that we we talked about is using this as a reasoning challenger. So challenge my reasoning, and then it can. It can come up with some interesting ideas. This is something I could do

Riccardo: reasoning challenge is a nice way of depicting it

ID_3

id_3: Right. So if you talk about workflow. So I can give, like, two perspectives on this, basically. Because on the one hand, I did several projects, multidisciplinary projects, kind of similar to this case, during my studies. Because it was, like, to work a lot with other people from, like, water science. And I have to say, like, working with people from other disciplines is difficult in terms of you have to really spend a lot of time and effort to get on the same page and start using the same language. And I think ChatGPT can be very interesting in this because you have to really be careful what's, if you work with ChatGPT, the input is going to be very simple and it reacts quite directly to your prompt. So basically, if you put in a prompt, it's going to, the output of ChatGPT is going to be dependent on what you put in. So it kind of forces you as a group to discuss more explicitly why you're using certain terms that you're using, why you're asking it the way that you are asking it. Which may be too, if you are just working with yourself, would seem like something obvious. But then if you work in more multidisciplinary teams, you kind of have to get in line about that one language that you're using, that everybody understands that it's about the same thing.

So I think in that sense, ChatGPT can be very interesting because it forces you to get on that same page and to think more explicitly about the terms that you are using. But then at the same time, if you talk about workflow, using ChatGPT is also a bit disruptive because you have to go, sit behind a laptop. I don't know if everybody is using their own laptops or if you're using one screen. So, and also ChatGPT in terms of, I think if you look for a solution, maybe I'm also skipping ahead a bit, but I'm not sure if ChatGPT always gives the most interesting solutions. Sometimes it does, but generally it states the obvious.

Riccardo: Fair enough. And if you were to envision this scenario with, you have to, you represent the team and you have to deal with these multidisciplinary subjects yourself. Like you're not interacting with the different people that represent these subjects, but you have to figure it out yourself and enter all the...

id_3: So I would be on my own.

Riccardo: Yes, basically. And you have to figure it out that and you're not really into those.

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id_3: You can always ask ChatGPT to give the perspective of someone who would be in that field. Well, it's still, in my experience, it still keeps stating the obvious little bit and it can be interesting, but I've had, I've tried to push ChatGPT sometimes to develop scenarios that would be in line with my own perspective. And that would also be maybe a bit more critical. And you really have to still push for the right prompt. You really have to steer it a certain direction. You have to ask it to elaborate. And sometimes it can't. So I think that in order to get a solution that would be satisfying from the perspective of a software engineer, for example, you kind of also need some software engineering background to really push it in the direction. So it can be helpful a bit to give new perspectives. But I think it's also in the capacity of many people. If you want to take the time and effort to think about other perspectives, you could have thought of them yourself as well. It just saves you some effort sometimes. So what does happen with ChatGPT a lot is if you prompt it into a certain direction or you want it to give, for example, what we do a lot in the workshop is that we first have it that we ask for ChatGPT to give, for example, worst case scenario type of story. And then we prompt it to be, okay, now do it like the opposite. Or now do it or make it worse. Make it more detailed or make it more funny. And sometimes you get or how I use it for my own work, for example, for just my thesis, because I'm now talking, I was just talking about the workshop experiences that we had. But if I talk about how I use it for my own work, for my own thesis writing, I use it a lot for examples. So I write this part about like a theoretical part and then I want to have an example. And I can, of course, think of an example myself. But I can also ask ChatGPT, what would be an example of this? And it gives you the story and it's just quicker and it's helpful. But it also always needs this test of a skilled human being to check if it makes sense and if it's comprehensive enough to. So I would never also, of course, for plagiarism reasons, but I would also, I haven't experienced that much that I asked ChatGPT for an example. And then it gave me something that was fully satisfying to just. To just put it in.

Riccardo: So we agree on the fact that it doesn't aid you in actually solving the problem, but in some process of it.

id_3: Yeah.

Riccardo: And if you were to give a name to this process, what would it be? Like what is the skill that ChatGPT would then perform well in this problem?

id_3: I wouldn't necessarily call it inherently creative, but I would call it just a more efficient tool. Because, well, I don't know how you call the activity in. There's probably like a business term for this, but the activity of brainstorming and writing things down and then. Because we're also we're also talking about text. So it's not just about ideas, but it's also about the wording of those ideas in just a structured way. So that's the process that ChatGPT just saves a lot of time on and not necessarily. I wouldn't say necessarily gives a lot of new inputs. But, yeah, I would say time.

Riccardo: So it gets more efficient. All right. Then how would you think the team you would have performed if you were to compare it to traditional search engines like Google instead?

id_3: So I think that it saves a lot of time, but it also kind of in a way... I think it doesn't necessarily do that, but there's the risk of it limiting your scope because it's so easy to get like instant gratifying answers that do the job. They're fine. But I think you didn't give yourself or your team

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enough time to think about all these weird, maybe invalid perspectives. But you also miss out on that process of letting your mind wander to all these and challenging each other. So I think you get very easily pushed into this corner of like, OK, so we're going with this, which is a strategy, I think, because sometimes it's, of course, group processes can be frustrating because you're like, this is irrelevant. We're spending wasting a lot of time here. Let's just go with this.

But on the one hand, you're also missing out on that in terms of really developing new ideas. And I think if you use Google, you would also get some type of search terms that maybe seem irrelevant at first, but then can spark new perspectives. And I think with chatGPT, it's very tempting to go for the low hanging fruit and just like: instant gratification. We have our answer. It works. It seems like it's straightforward. So we're going with this. And I think that's kind of the friction that you're missing out on also.

Riccardo: OK. So you would say it's more tailored to what you ask for, whereas Google can give you more.

id_3: It usually makes less sense. And then also with Google, you can also see the sources that proclaim certain things, which can either make you feel like. So if you would have like, I don't know, if you Google certain issue and there's like all these credible news outlets that have been posting about this or you find all these articles, you can instantly get a sense of how seriously people are already thinking about this, how important it is, how many valid sources there are on this. And that can also give you certain information. But then with chatGPT, all the information looks the same. So you have no idea whether the output that it generates or the solution that it proposes is actually supported by a lot of other valid institutions or not. And maybe that's not what you're looking for. Maybe you want something that's like under the radar or very new, but there's no way of knowing. So I guess that's also more. Informative, if you would use Google, you have a bit more like self-reflection on the topic.

Riccardo: OK. You're really seeing it from a research perspective in this case. So basically, gathering information. All right. And if you were to, on the other side, interpret it as not something that you use for gathering information, but something that you use to find a solution which does not require that specific information, like that reliable source, you wanted to use it for this type of. Yeah. Well, you need to come up with a creative option to get around.

id_3: You're talking about something new right? Because what I'm thinking is if you want. Maybe I'm also like too much of a research perspective, but I feel like if you want to develop a solution, you need some information at least. But also if you want to think of something new or out of the box, that's maybe a good word for it. You also need to know what's already there. So but if you want to use it for something new, then obviously chatGPT would be better in terms of Google can only provide you with already existing information. And you can use Google and all these different ways to get inspired. But then you cannot just Google what would be a good solution for this that doesn't exist yet. Google cannot think of something that doesn't exist.

Riccardo: It's the generative part of it, right?

id_3: Right.

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Riccardo: It just comes up with something.

id_3: Right. Exactly. So chatGPT bases a lot on information that so if you would ask it for a solution, it would probably also give you something that you could Google. So you could Google like what would be a solution to this? And you get all these existing solutions and chatGPT kind of works the same unless you prompt it in a way that forces it to think out of the box as well and generate something new. But it's really difficult to do that.

Riccardo: Yeah. Because it's technically incapable, right?

id_3: I wouldn't say it's incapable, but it's so what we do with the workshop is that we create problems that aren't real. So we take like these cards and we put certain prompts on them and we mix those around. And by mixing them, you get something that is a story that chatGPT has to build around something that's not actually something it can Google. So in that scenario, you would get weirder. Like the other week, we had a workshop where one of the prompts was that there was something with there are issues with the weather, but we also had an AI weather controlling machine. But then in the end, it was controlled by squirrels. And we had to force chatGPT to answer all our questions about this scenario and put it in different. So what would happen if we can contact the squirrels? What would happen if we cannot contact and communicate with the squirrels? So then it's forced to think about new because of this. I don't know. I haven't Googled it, but I'm pretty sure if you Google this scenario, you wouldn't get many Google results probably. But then chatGPT is able to think of these solutions for certain problems that exist in this world that doesn't exist. But if you would apply it to because I feel like this scenario is more about real life cases, then it would probably also gather information from what you would be able to Google.

Riccardo: So you can say that the response is basically it's how NLP works, right? It just gives you the most likely word after it. It's like finding a Google search and then just taking the first five and then figuring out what the next word is.

id_3: Yeah!

Riccardo: All right. Scenario number 2: You're a creative designer and you must create a new logo for a company's new service that will launch soon. You want to use chatGPT to help your workflow and you found out recently that it can memorize the previous text that you sent as a prompt and its response. You care the most about addressing all the requirements that you were given, but it is difficult for you to keep track of all of them without losing focus on your creative workflow. It's basically when you're conversating with chatGPT that it just keeps in mind what you wrote before and there's very important requirements that you need to consider when getting to this solution for a new logo for a new service. First of all, reflect on how chatGPT in this scenario might have facilitated your workflow. Maybe a specific function or just how you would use the AI.

id_3: Right. How I would use this or how we use it in a workshop is maybe a good example because we use chatGPT to develop prompts for DALL-E. So, what we have is we have this whole conversation with chatGPT about our imaginative squirrel scenario and then we ask it, so now based on what we just discussed, can you give us prompts that would be helpful for DALL-E? And then it does. And I'm not sure if it's very good at giving prompts. Because DALL-E is also a skill, right? So, everybody can use it, but to get actually nice visuals, you need to have also certain skills and I don't think chatGPT gives prompts

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that automatically lead to what I would consider a nice picture in DALL-E. But it does give sensible prompts. So, it just gives like a sentence that basically summarizes the scenario or something. So, in that sense, it kind of helps because it's good at summarizing the key parts of maybe a large chunk of information. So, in that sense, it's helpful. But if you want to use it to then use an image generator, you still need some skills. So, I don't know.

Riccardo: Maybe imagine you're the creative designer and you're having a conversation with chatGPT about what things should be embedded in the logo, maybe visually some brainstorming activity as well. But then you have mentioned all the requirements before and you wanted to remember the requirements because you don't want to fade away. Maybe you cannot use certain animals. You cannot use certain shapes and chatGPT keeps that in mind.

id_3: But chatGPT cannot design itself, right?

Riccardo: No, no, no. But you're going to use it. It's not that you're using it for replacing what you're doing. It's meant here as an example for you're using it as a tool.

id_3: Right. So, you're meaning that you could use chatGPT to describe the design for you or how would you? Because it only generates text.

Riccardo: Yeah, let's say you know some things that you want to embed in the logo and you know a lot of information about the company, right? And you want to funnel this information about the company in a way that it's being represented by the logo and you need to keep in mind that the requirements... they already used a different logo that represented those kind of visuals and you don't want to use those visuals again. Or you don't want to use a certain color.

id_3: Yeah, exactly. So, my partner is a designer actually and he uses chatGPT for, I think also like not necessarily for logo design, but he does use it in his work sometimes to also kind of, I think more for text still, but I guess in that way it can be very useful if you have a lot of information. But I don't think necessarily... it depends. So, I think the broader question is about how chatGPT kind of can summarize large parts of information to smaller ones. So, I don't do anything with graphic design. So, I don't actually use this in my own work except for the workshops where we use it to develop prompts for DALL-E. But what I do do that's similar is that sometimes I ask it to summarize a book for me and then I ask it, so this book has been written by XYZ. Can you give me a short summary of the main parts of chapter one or something? And it does that, but you have to be careful because it does that, but you don't always know if it's correct. Of course, of course. So, I would be a bit careful about this if you use it to summarize the most important parts of the, it can help, but also it can lie and you wouldn't know. So, I would be a bit careful about this.

Riccardo: And then, how might the AI's assistance, yeah, context-aware capabilities influence the effectiveness of, yeah, I mean, this was a different example, of the decision-making process in this workflow?

id_3: I mean, again, you have to be careful there because on the one hand, of course, it's helpful that you can just have this long conversation with it and then be like, so, what we said before, make something or summarize or do this. So, it has these capabilities, but it also gets confused and it

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doesn't always know the difference between when you kind of change the subject or when the conversation went to a certain direction and it doesn't always know which part of the conversation you are referring back to. And it has these context-aware capabilities, but not always. So, it also has sort of, I can give you a very clear example of how it doesn't always work. We sometimes say it because we want it to create scenarios in the workshop. And then, but we don't want it to go on for like 500 words for each answer. So, at the beginning of the conversation, we say you have to answer max 100 words for each answer. And at one point, it forgets. It forgets. So, it does it in the beginning and then at one point, it lets go of that.

Riccardo: I assume you're using also GPT-4 for these things, right?

id_3: Yeah.

Riccardo: So, you're already having the most advanced one as well.

id_3: Yeah. So, then at one point, it forgets that we made that agreement early in the conversation. So, it's very, and it's difficult sometimes. And here, you can clearly see where it lets go of it because we said 100 words. And then, it goes over and it's like, okay, this is where, I don't know why I'm calling it a he, but where it forgets. But then, afterwards, it's sometimes you don't, like if you would have a normal conversation with it, you wouldn't know. It would be more difficult sometimes to pinpoint where it takes off. So, if you would ask it to summarize something based on the whole conversation, it might take out or leave out certain things that you would have considered to be very important.

Riccardo: You need to like remind him, right? In the prompt.

id_3: Or check if it did it correctly. It's a lot of work still. So, I'm not sure if ultimately, it depends also how stuck you are, I guess. Sometimes, if I would use ChatGPT for my own work to get some inspiration about examples, for example, then I would only use it if I'm stuck. So, I would have done the work. I would have already tried to do the work. And sometimes, you're like, I've been staring at my page for a good hour. And then, you get this inspiration. ou're like, oh, yeah, it makes sense. I just did. And you can apply it. But, yeah, that's my workflow in terms of using ChatGPT for now. It might change in the future.

Riccardo: So, basically, you use it in the moment where you want to have a different perspective of something you want to.

id_3: Yeah. If I would be stuck, I would use it. But I wouldn't necessarily. So, if I would have been a creative designer and I had to do a logo, I would definitely first try to do that work myself. And then, if I'm like, it's not really nice. Or if I already did it and I'm like, but I want to check. I want maybe some new inputs. Or how I could use it is to explain to ChatGPT what the logo I designed looks like and how it would reflect on that. So, what would it add? What would it change? Does it like it? What does it like it and why? And you can use that to kind of affirm yourself. But I wouldn't use it as the main necessarily because it can also take you more time to check everything than just.

Riccardo: We now talked about the ability to summarize the whole conversation. And I want you now to focus more on like still considering this, solving this problem. The fact that you can conversate with it. So, it's part of the

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conversation like to keep the conversation in mind. But then also like this side of, yeah, having a language model that almost acts like a human. Like it wants to, right? How does this conversational aspect you think influence this or affect this problem solving?

id_3: So, I don't. I've never used it to have like nice conversations with. Because I know some people do. And like I also don't have to kind of keep myself from doing it in the beginning always. But in the beginning you tend to want to write, hi, can you please do this for me? But the language that I use is just like make this, do this, make it more like this, do it more like this. So, it's really like giving it orders. But you could, I mean, my first instinct would be to add those words like please do this. Thank you. You want to thank it, right? So, you as a person, you tend to like, you have to, at least I have to resist falling into conversational courtesies.

Riccardo: And you don't think that it would then, I don't know, help you in some way?

id_3: I don't think it would matter.

Riccardo: Not a thank you or a please, but yeah, just taking out that capability of it to pretend as if you're having a conversation.

id_3: Yeah, I don't think it matters because in the end you're also not going to, I mean, it depends. It doesn't matter for the output, I think. The chatGPT is not going to respond differently. Except if I would use it for a conversation, right? Then it would start to adopt these mannerisms as well. It would know that you would be, but if you're just ordering it to do stuff, then it also just responds with an answer and that's it.

Riccardo: Do you see some value behind it simulating a conversation with a specific individual (doctor, expert, etc.)? I know you don't use it, but if you were to imagine it.

id_3: It's cool. I mean, I would use it maybe to. I use it differently, not in a conversational way, but in terms if I think what you're getting at. What I use it for sometimes is to reflect on it, because if I would have like certain theoretical framework or certain literature from a certain author, I could ask chatGPT. So if you would have this case, how would you reflect on it based from the perspective of what that literature says or not? So that can be very helpful because it can give you can just help you like it's efficient. And I think in terms of creativity or if you would create a new logo, you could be like, OK, tell me how Banksy would do it or in a style of. So that's how I use DALL-E also. Right. To say do it in the style of Da Vinci, do it in the style of Rembrandt. So it's cool if you would want to have a conversation with Edgar Allan Poe and you're like. I haven't used it that way, but I think there's a nice like. I think it's a fun gimmicky part of it.

Riccardo: The capability I wanted to focus here is then to create this like the context and how this creation of context can help or not help you. So I think we covered both sides.

id_3: Yeah. I mean, what we do with the workshop also is a lot like describe this scenario in a fun way. Describe it now in a more grim way and then be like, make it even more dark or like make it more dystopian. And that's also

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like or make it like more telltale or do it more like. But I feel for me, there's too strong of a "it's just a chatbot" vibe.

Riccardo: So I'm not there because you're inside the thing.

id_3: Yeah, I can't really envision it that well. It doesn't feel like a conversation. It feels like I need to prompt you in a way that I get output that I want. That's how it feels.

Riccardo: I mean, if you if you think about all those those start-ups getting like more and more adopted in the world of like dating. Also, like you have dating chatbots now, I guess. Yeah. And there's always dystopian like movies where you have the AI partner. Yeah.

id_3: Like Her.

Riccardo: Yeah, exactly. Like Her, like Blade Runner. You see it. All right. Third and last scenario. In this case, you are used to working together with a colleague to work on designing new projects for your design company. Unfortunately, he got asked to change the position in the company and you won't be able to work with him for the next year. Higher management provides you with chatGPT Plus with its new feature of quick responses to partly compensate for any extra effort that is now required from you as you will be working alone from now on. Reflect on the possible changes in using chatGPT in this scenario compared to your previous workflow.

id_3: Right. I think it's interesting. It depends on how you work with your colleague and it depends on how you what your working style is, if you like to work alone or if you like to work with somebody. In terms of if the cooperation was nice and you like to work, collaborate, then chatGPT is going to be very bad. And also it depends on the qualities of your colleague. Like if your colleague challenged you, if your colleague came up with all these new creative ideas, if your colleague was proactive, chatGPT is going to be a very bad replacement. If you like to work alone and if you like to not get too much backlash, then chatGPT is great because it will always be kind of in line with or usually it tends to be in line with what you're prompting it. You can challenge it to give opposite directions, which can be inspirational, but it's still limited to what you put in. It's like how I described it in the beginning with how Google can give you totally new validation and also totally new ideas. I think a colleague would be more similar to that than chatGPT. It's just quite it's quite a process to get it to come up with new and inspirational things and reflect and give you some. And it's slow, right? You have to type. It's different than having a conversation and having a person with energy and its own experiences. And I don't know, chatGPT is very limited in that, I think.

Riccardo: So, OK, so let's let's make it a little bit more realistic because, of course, we're comparing now the active workflow of a human in this case and the like the interaction with chatGPT. But if you were to consider the whole scenario as in you are working with a human, like in the span of 24 hours and you're working with chatGPT, you would spend 24 hours. How would that change things? But, yeah, does it change something to you from your point of view?

id_3: Or I mean, I would never work for 24 hours.

Riccardo: I mean throughout the 24 hour span, I mean, you're not going to work all of them.

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id_3: Right. Right. Yeah. So so of course, chatGPT is always available to you. But then chatGPT is also turned off the moment you turn it off, whereas your colleague keeps working even if you're not working together. So that person goes home. They are thinking about new stuff, whereas chatGPT you can access at any time. But you still have to like you have to do all the work. It's quite exhausting. It's like if you would go on a date and the other person wouldn't be talking. That's what chatGPT is. You have to really like put in so much. And then it sometimes can give you surprising things. But compared to the work that a person can do without needing prompts, if you would have a nice colleague, of course, you would like. That's what I mean with proactive. It's this colleague that's like a drag. Of course. Yeah. It would be more work. But if it's like a normal, healthy workflow with your colleague, I would say chatGPT is not better.

Riccardo: Yeah, of course. Then the personal side as well. Like if it works well, then obviously that influences as well.

id_3: Yeah. And you could ask a person, OK, so I work on this and you work on that. You couldn't ask chatGPT because you have to explain everything to it and then it can give you something. But the whole process is yours with some assist of chatGPT. So we are going to affect that for like general creative workflow, in this case, it's not better than your fellow colleague. So it's your performance would then decrease. And this specifically on the aspect of how would you define this aspect?

id_3: So. Creating. Well, I think it's twofold. So for one, the process of. The pre-output process. So thinking of ideas, setting up the workflow like. Brainstorming and then. Or maybe it's even threefold. And then you have the output process, which is the only part I think chatGPT could be useful in. So putting things on paper, writing it down. And then you have like the reflective part. That is also. And of course, it's not usually not this linear. So there's this bouncing back and forth always. But and but in terms of reflection, I also think it's way more useful to be with an actual human than use chatGPT. Because it just works better.

Riccardo: You just know, definitely, definitely. You mentioned this back and forth behavior. And if you were to compare them to a human, would you say that it's always like that or is it just in some moment?

id_3: It really depends, I guess, on how your workflow works and how structured everything is. I don't know. I guess if it would be design, you would go pretty back and forth.

Riccardo: And maybe if we were to focus on the reliability side in the sense of like.

id_3: Well, it also depends on your colleague, because some colleagues can be very unreliable. And then and then I'm like, if it's someone that costs you more work in terms of collaboration, then no, it would be better to either work alone or with chatGPT. But I don't think it's then the question is better to work with chatGPT or colleague. The question is, is it better to work alone or is it better to work with a colleague? And then you can use chatGPT whenever you want. But I think that. In terms of availability, yeah, I think for some parts, maybe, you know, the only thing where I would be like, OK, chatGPT has really the upper hand is when you have all these things worked out, like everything that needs to be in there and it just needs to

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be put on paper. So if you write like a text for websites, for example, you know, these parts that need to be in there. You can just ask chatGPT to do that part of the work. Maybe it would have taken your colleague an hour and maybe they're bringing their kids to work and maybe they can't make a deadline, whatever. And then you can just put it in chatGPT. But I feel like that's also something that. I mean. It's just an aid, so I see it more like how. Maybe, you know, chatGPT is an addition to the workflow in terms of how words is an addition to the workflow. It just saves a lot of time and it's practical and it's nice to. Yeah, right. But in terms of and it gives all these new opportunities, you know, or PowerPoint, for example. I think PowerPoint is a good example because PowerPoint also gives a lot of creative opportunities that fit into that format of PowerPoint. But they aid the user a lot, but they aren't a replacement for a creative process behind it. You cannot, of course. And I feel like with chatGPT it's a bit the same in the end. I think we're on the same page on this one.

Riccardo: And how about. Yeah, I mean, we talked about the collaborative aspects, maybe more on the feedback aspect. Because when you collaborate, most of the times like you want to evaluate each other's output. Right on that. Also, on that side, you would say it's. It's either too complicated to assess in a distinct way or is it just inevitably better to have this feedback with a human like with your colleague?

id_3: I think. So a colleague will just also depends on the person and how you are with each other. So some colleagues will tell you that everything is fine and be very uncritical. Other colleagues will totally roast. Everywhere, all the work you've done, you will probably miss certain things because you may be working together and are very happy about what you did together. But then third person view would be like maybe you lost yourself a bit there. So there's all these different types of feedback that can exist between two or more people. But then I think if you would use chatGPT it's going to be dependent on the feedback that you are willing to let it make. So you can be like, what do you think about this? And chatGPT will maybe

Riccardo: critically analyze.

id_3: Yeah. And its first reaction might be, oh, it's great. And this and this is good about it. And then you will be like, oh, I totally agree. And then it's maybe you're like, OK, this is it. But you can prompt chatGPT to only be critical or give good critique from if you would have this perspective or that perspective. But then it does still rely on you being able to push it for more perspectives and for more critique. And so it also depends on your skill and the level of critique that you are.

Riccardo And you would also do that with your colleague, right? If your colleague is not. Also depends.

id_3: If you're not asking. Depends on what type of reflection you want. Yeah, I think it can be an addition to and also addition that if you would. Work together that you use chatGPT also for like third perspective. I mean, why not? It's always nice to. It's easy to include it for a new perspective. So but you do need to be like remain aware of what it's saying is not the truth. So, yeah.

ID_4

Riccardo: Scenario number one, I can read it out for you real quick. It's a little bit long, so it can, you're going to take your time reflecting on it as well. So imagine you are collaborating with a multidisciplinary team on a complex challenge, and this challenge is creating a innovative product line for a company specializing in consumer electronics. The project demands expertise in industrial design, product development, software engineering, and marketing. Despite the diverse skill set, the team encounters a creative roadblock and may lack the knowledge required for successful product development. To overcome this obstacle, the team decides to incorporate chatGPT as a supplementary resource. How do you think, I mean, do you have any questions on this scenario? Should I explain, explain you a little bit better? I mean, I don't want you to then focus also too much on the scenario. If something from your personal experience comes to your mind, feel free to share with me. But yeah, if you

id_4: The scenario is quite clear, but there's no people from advertising, right? So it's just about the product development and not all, or what is the, the marketing has something inside of advertising. Or it's just because that's one creative component and then it's very interesting.

Riccardo: Oh yeah, under marketing, you could say that there's also advertisement, right? Yeah. It's the, here it's listed as in that it's a multidisciplinary task. So it requires more, more fields. That's, that's what should remain in your mind. How do you think, how do you think then engagement with the chatGPT would have affected the team's ability to, first of all, without even considering question number one in general, well, how do you think chatGPT can affect the workflow like in good or bad ways? You can argue both sides.

id_4: Well, it is difficult to answer because one problem with chatGPT is that somehow it lacks, how'd you say that in English? It lacks specificity. Because it tends to go on very vague things. And so you always have to, uh, using the right prompts to drive chatGPT back to what's your goal to, to what, what you expect from chatGPT as an outcome, because sometimes it's just go somewhere else and you're, you're, and you have to tell him, uh, like, no, please stop. Come back. Right. Um, so I think one, one good thing that chatGPT often, well, but all generative AIs also, I would say, uh, have as a good, uh, as a good element. And I'm also, uh, studying a bit there with Caterina is, uh, that somehow it helps opening new scenarios that humans would have, would have not thought of or not have thought of in the immediate. Um, so sometimes you talk with chatGPT and it brings in things that you hadn't even realized could be connected to what you are, uh, dealing with at the moment. So that would be a great for, for, I mean, for all kinds of creative processes, I think would be kind of a great, um, um, positive, uh, point, but the flaws.

Riccardo: Yeah you basically already answered question number one, which is "How do you think that would have affected him and the team's ability to connect seemingly unrelated concepts" So I assume for you, it is possible.

id_4: Um, the thing is it is possible, but in my opinion, um, it might be difficult to make it connect things that you tell chatGPT to bring it in new things that you hadn't thought of. And so suggesting new connections, uh, it works like as a second brain sometimes, you know, if you're lucky, uh, that's also kind of a, that's a good amount of luck also, because you have to be able to expertise in getting the right prompt, but also being lucky in, you

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know, what kind of process, uh, chatGPT goes and what kind of links, um, brings them. Yeah. But as your input, sometimes it works. Sometimes you have to, I mean, it happened to me to, you know, spend two hours to make chatGPT understand what I want to know.

Riccardo: So, yeah, I see. So basically you think it's a sort of a fake way of connecting these unrelated to the subject because you need to explicitly tell them or like it.

id_4: So the fact is, I think if you, if you, so if for example, this scenario, if you, uh, so there are very different skillset and there's a point where you're stuck, right. Um, and you can go, you know, you, you like as a scenario who says, yeah, the cross disciplinary knowledge, the fact is, in my opinion, if you just, as these are maybe some complex scenarios as well, if you just, um, present chatGPT with a scenario and just tell, go on, or can you solve this? It may not be straightforward that chatGPT gets a solution because at first, one of the things that chatGPT has been trained to tell you is I'm not a human. I can't think, you know, that's something that you're always, uh, that you very often find as an answer when you work with chatGPT. So I think that if you ask for finding some links, you know, like for example, there are three different things that, you know, have to be linked, but you don't know how, so you can point them out, but if you just give the scenario and tell, okay, we're stuck here, what do we do? I'm not sure that chatGPT may come up with a creative, um, solution that brings that connects everything that you want to connect, right? So it's not fake. It's just, it may not happen as you want it. It may not happen. It may not perform the task in the way you want it.

Riccardo: Also here as a disclaimer. Here, it's not really intended as a tool that does the tasks for you. And let's say concludes the task, but it's more as a tool that you use to supplement or at least like you use on the side of your, your work. So it's easy to think of it as a replacement of what you're doing, but I would like you to more focus on how it would affect your workflow and, uh, in this scenario and in general on your personal experience on how it contributes or how it works against. Second question. How do you think this interaction, uh, would then encourage the team to consider alternative perspectives or viewpoints that might not have considered otherwise? I mean, this sort of what we discussed already, but if anything else comes to your mind, please go ahead.

id_4: Uh, yeah, I mean, that's the metaphor that, that, um, that in my opinion is, is, uh, interesting. It's like, um, I don't know, sometimes I have the feeling when I, um, when I talk about chatGPT and AI is that they work, work a bit like either mirrors or oracles, you know, like some magician that you're asking something to, but ultimately there are human creative tools. Uh, so somehow, yeah, they work like something where you reflect yourself and you get our aura as a second brain as well, you know? So in that sense, they encourage you because you get in a very quick time, some inputs that may be alone, or even with a group, you would have needed, I don't know, weeks to come to. And it happened to me as well, you know, in a, I had to write some stuff and of course I didn't use it to write it for me, but I use it to organize my ideas. And I managed to dialogue with chatGPT to get an outline where all my very, very unorganized ideas were finally placed. I mean, it took me hours to do that. Okay. Okay. But dialoguing with chatGPT helped me go on with my ideas and kind of, uh, find a shape for them and an order for them as well. So in that sense, I think that's how it helps you encouraging order.

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Riccardo: So to some extent it is able to then connect your unstructured ideas.

id_4: Yeah, because actually you're, I don't know how to say your, uh, dialogue, which has a PT it's actually you making the job. I had this feeling in my case, it's you making the job, but said GPT is as a very powerful tool that helps you. You're in dialogue with someone who doesn't have opinions, because they can't really think, right. It tries to have no opinions or biases. Of course it has the biases of the databases that you used to train them, you know, and so we had already issues of racism on the first models. But I have the feeling that it really, it helps you see in yourself better, you have something where you can reflect into. So in that way, I think it helps you connect concepts. And sometimes of course it connects in its own itself because I don't know, it reproduces patterns that it has already seen somewhere and just put the things together and say, oh, and you say, oh, I haven't thought about that. Right.

Riccardo: If you were to, um, look at the generative aspects of it, it doesn't like, we could argue about this as well. Right. But it's not like, um, an old fashioned artificial intelligence that just finds the connections between, um, the data and gives you the result. The generative aspect is we can say that it's, it generates something new, like to some extent, what do you think about it? Like, do you think it actually generates something new? Can we call it something new?

id_4: That's where it's difficult. So, yeah, so I mean the whole thing of what is new is very difficult to answer because already in the art field, uh, that's kind of a debate whether actually artists are creating something new or just re elaborating what already exists, right. Or what already have been said. Exactly.

Riccardo: Um, exactly.

id_4: With chatGPT, I don't know. So, well, for example, with generative, uh, so image generating models, like, I don't know, mid journey, for example, or DALL-E. Yes. I have a feeling that something new is created in the sense of something that an image that actually didn't exist. And you can also argue whether there's create, I mean, creativity in that. Um, I mean, yeah, I mean, I, I'm, I'm more, so let's say like that. So if you ask me just in general, is it something new? I would say, of course it is because it's a new combination of things, right. Whether it's chatGPT or DALL-E or mid journey, if you talk to me about creativity. And so for example, work of art or something like this, I would tend to say that. So sorry that mid journey creates something new. I mean, I would, I would say that more than for the chatGPT case, you know, um, because I have, I don't know, maybe because it's a bias that I have, but it's as if like the, I see more of a, um, oh, it's, I've never thought about that. Actually. It's like, I don't know. I have a feeling that they work really differently somehow. And that chatGPT sometimes just, just put random words and, and create some texts and, but sometimes they have no relevance whatsoever. You know, they, they like sometimes they make, sometimes they even empty, I would say, whereas mid-journey is never...

Riccardo: hallucination.

id_4: Well, actually, do you know, if you know that work of there's an Italian artist, which is called, who's called Roberto Passone. Um, and he trained

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his own AI, uh, which he called lie. I think I do remember. So he trained about hallucinations. He trained an AI with stories of, um, magic mushrooms trips. So there are, there are some websites online with huge databases of real stories of people that went through trips, you know, of this kind. And then he trained his own, um, AI to create new stories of hallucinations and that's, and it was incredible what he got. I mean, and then he, I mean, from there on his own creative process started, right. Yeah. And with thoughts. Yeah. And so he created like a book. Um, so these, these AI, uh, I don't know if that's the same model that they use in chatGPT. I have no idea, but, uh, at some point this, this AI even came up with a name of a song or an album. I don't remember that didn't exist. And so Roberto said, okay, now I'm going to write this album with, with the AI. And so he made the AI, write the songs. So the, the lyrics, uh, and he, he created a real album out of, out of all of that. And you can see, uh, he made an exhibition, he made, uh, it's incredible how many things he did with this project. So, and I saw it in Turing, the movie. Why do we come up to this? Uh, oh yeah. With chatGPT you really create something new. But text generating AI models, with chatGPT I never had a feeling until now, or, you know, something really, uh, like I said, Oh, then, Oh, touch GPT is as agency. chatGPT is creating something. I, and I can still now, I never had this feeling, which had to PT. I had the feeling that it was just meshing up things, um, quoting stuff or yeah, that's it.

Riccardo: So yes, but not a lot. Yes. Yeah, no, no, no. It's perfect. Yeah. So yeah, it's, but not a lot. So it's sort of more on the, it's, it's more of a tool that just mixes up information and gives you what you want.

id_4: It has less agency than mid journey, I would say.

Riccardo: Yeah. Okay. Yeah. When it comes to the creative process, like the ideation process of this, uh, hypothetical team, how would you think that implementing chatGPT would then portray their ability to, yeah, I ideate and just ideation. How do you think that would then, uh, evolve in the long term?

id_4: I think the ideation process would go incredibly faster than without chatGPT.

Riccardo: I mean, so you think it would improve the creative process? It would surely improve, uh, at the same time. I mean, uh, the human element is, uh, to, you know, kind of oversee the whole process and realize if you're getting off track, for example, uh, because chatGPT can just, just don't understand this. It just doesn't understand this. So, uh, as I told you at the beginning, sometimes you have to tell chatGPT now, please stop, come back because you're just mad, you know, and chatGPT will tell you, Oh, sorry. I didn't realize this. Something like this.

Riccardo: The next scenario, the next scenario handles is a bit more on this. Okay. Yeah. Yeah.

id_4: But I think it would go incredibly faster. Um, um, maybe open your scenarios for that mirror effect I was talking about. Well, nothing, nothing excludes that it could also go worse in the sense that maybe it could, I do not point out many flaws of your original project. And so you get even more stuck than, than you, than you were at the beginning. That's good. That could be another, another option.

Riccardo: Yes, that's a good point. That's a good point.

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id_4: But it is part of the process. I mean, again, you, you can see things that you hadn't seen earlier on. Maybe we have to abandon this idea. It gets nowhere. Even with chatGPT, it gets nowhere. Although chatGPT always makes it work somehow. I mean, always gives an output. So, but then it's you who are going to interpret, uh, the, the, the outputs.

Riccardo: Yeah, I got it. Perfect. Yeah. This completely covers scenario number one. We can go over to the next one. The next one is: "As a creative designer, you're given a task of designing a new logo for a company's upcoming service launch. You recently discovered that chatGPT provides you with a context-based response and could retain the information of your previous interactions with it, which you believe will help you help you streamline your workflow. Your main priority is to address all requirements provided, but you find it challenging to keep track of everything without losing focus on your creative process." So you sort of want to use this tool of remembering the chat for your benefit. So the first question would then be, um, yeah. How, in what way do you think chatGPT affected your, um, your, your task in this case, but while still addressing the client's requirements while maintaining focus on your creative process?

id_4: So I'm not really sure on the answer here.

Riccardo: If you want, I can give you like one or two minutes because I also need to run to the bathroom if you want.

id_4: Well, I have a question I would like to ask in this scenario. Like, I don't know, it's the, it's, it's, don't consider the plugins, don't consider all the extra stuff.

Riccardo: It's mainly the conversational aspect. So having another entity that you can have a conversation about the dialogue like you explained it before.

id_4: It's the ideation part. So you're just, um, it's still the part where you're developing the idea, right?

Riccardo: It's the part where you are getting somewhere, but you're given some limitations, some requirements that you really need to meet.

id_4: So it's, yeah, it's not, it's really not easy to answer this one. Um, so because I, well, first of all, I don't know if this function is already, so if it's an extra function that you get just with the premium version or if it's already embedded, you know.

Riccardo: It is already embedded in the free version, but if you use it in chatGPT 4, it works a little bit better. Do you use the paid version or the free version?

id_4: No, I'm using the free version at the moment because I'm not using that extent, you know, right now. Um, but yeah, I, I mean, I had already experienced of chatGPT remembering stuff or, well, not remembering, storing I would say, um, previous conversations. So that when I was referring to previous stuff, chatGPT was able to remember what we were talking about. Uh, but yeah, the thing is up until now, I never had the feeling of chatGPT telling me, uh, yeah, you know, you're going off track, like, uh, your goal was this and this and that, and now you're doing, you're doing something that goes against it,

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or that is not coherent with that. It's usually the opposite. I am doing this. I am, I am telling this chatGPT. So in that sense I don't know how it can affect and how it can help taking into account the requirements because usually, uh, even with writing an essay, for example, it was always me. Uh, so for example, organizing the ideas for the essay, it was always me telling chatGPT.

Riccardo: Maybe I can make an example. Let's say you're given a list of the things that you cannot, uh, mention the topics you cannot touch upon. And in this case for the logo, maybe some forms, some shapes, some objects that you're not really allowed to use, or maybe some colors, color codes, and so on and forth. Technicalities also that might distract you from your creative freedom. Is that clear enough? That realistic scenario? Maybe you can portray it on something you did.

id_4: It's realistic, but the fact is that often, uh, as far as I, as they have, well, probably, uh, with chatGPT 4 is going to be better, but up until now, what I, what I've experienced is that after a while, so I think there's a threshold of, um, how much distance in the conversation, um, chatGPT is able to store the same information. There's a point after which to forget. So that's a problem when you're going, through a long process, like, I don't know, uh, uh, I mean, um, doing the project for a logo is not something that a designer does in two seconds. It can be a long process. I have the feeling that sometimes even, I mean, chatGPT can forget things. And so you, you human have to remember chatGPT. Okay. Uh, that's what sometimes I did. Do you remember when we, uh, so take back, I don't know, for example, I remember at some points there was an output, like all of the scheme, for example, that I was really happy with and I said, okay, it's right as I want it. It has the arrows as I want it. It has the bullet points as I want them. It's, um, the right good amount of synthesis that I want. It's it's like, take pieces as a model, remember this. And I, and I told chatGPT, um, store this under, under the name, I don't know. Good, good 1. Good 1. So whenever I say good 1, start from there. And so that was a way that I could always tell chatGPT.

Riccardo: Yeah, you need to remind him.

id_4: "Now you forgot. So, uh, do this on the model of good 1." And also that sometimes, uh, you have to, you know, it takes some additional time again to, um, get chatGPT on track, maybe with a chatGPT 4 this, this thing would be enhanced. And, well, I mean, every, every update is, I don't know, it feels like five years have gone by, you know, for every update. So, um, it goes so fast, but that's what I would say. So it would help us at the same time. Uh, it kind of always need the human to remember what the limits are because otherwise chatGPT just goes on its own sometimes, you know, so it would help in some moment that another, it would probably slow down or even makes some steps back in the process. And so that doesn't have to maintain the focus on the creative process because you're again, always focusing on the limits and on the fact that chatGPT wasn't effective enough. So yeah, in this scenario, I don't know, it could be counterproductive sometimes. I mean, for, for what is now the state of the art. Um, I see, I see what you mean. And for yourself and your expertise, have you ever used it to sort of, I mean, yeah, you, you just said it right.

Riccardo: Let me ask you, uh, has it ever helped you or has that ever affected you? Uh, keeping in mind the general picture of an issue you had, because now you use that for a tool of remembering a good form of text that you had.

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Right. And have you ever used it to, let's say, keep a general like point of view or, um, do the job of just having consistency in the work you're doing?

id_4: I used it sometimes for proofreading. Once I actually used it for, so for kind of a, of the whole process. So first part, so again, essay writing. So I was doing the writing, but at the same time, I was always using chatGPT to dialogue and to, uh, like have, um, I don't know the guidelines somehow. So, and the, and so I did this exhausting and time consuming job of creating the whole concept map through the dialogue, which chatGPT. And then I started writing. And the main reason why I used it is that I didn't have enough time to write this. I had a very strict deadline. And it was very accomplished topic. It would have taken me probably three weeks to write something, uh, with my own pace. Right. Um, so first of all, as I told you, he helped, uh, he helped me get my ideas back in place in a very short time. And second, every time I saw, I was writing, um, and I was asking for feedback for every paragraph, I was giving that to chatGPT in the same conversation and asking for, um, for a feedback.

Riccardo: That's scenario number three, that's number three.

id_4: But for a coherency, you know, uh, I was kind of adding paragraph after paragraph, and I was always telling, uh, you know, is it coherent? It doesn't make sense with the scheme that we had at the beginning. And actually I had the feeling that after a while it was just telling me because it was, it was just telling yes, because it was trained to do so. It never told me that it was not coherent, never ever. So that's a question I have. I mean, chatGPT, in my opinion right now, it can't, it can't evaluate internal coherency that well, um, that that's still a human feature. And, and in fact, many times it comes up with very vague, um, vague outputs, especially for, you know, active writing or this kind of stuff. So I kind of realized it probably, it was better to use it for proofreading and paragraph organization, you know, this formal stuff, but as for the content, I think it was not really able to grasp the coherence. I was always saying yes.

Riccardo: When it comes to providing your context, it's not really that, that good for your use. When it comes to, when it comes to evaluate the big picture. chatGPT can't still evaluate the big picture, picture in something that goes beyond 500 words, I would say already, or let's say 1000.

Riccardo: This brings us to scenario number three. As a disclaimer, again... It's, um, it's more of a GPT as a tool, so not as a replacement for your job or the job of the scenario. And it's more as a tool that is there for the, in this case, the support specialist. So yeah, imagine you're a support specialist and a tech company that provides software solutions for small businesses. Your role involves assisting clients with troubleshooting issues, answering inquiries, providing guidance on how to use the software effectively. Also bear in mind, there's all kinds of clients from any age, any proficiency, everything to help you manage the high volume of the support requests and provide real-time assistance to clients. Your company has implemented chatGPT plus when it's rapid response feature, it's the 3.5 turbo. It's very quick. The goal is then to enhance the quality of support you provide while reducing, uh, response time. So first of all, how do you think, uh, in this case, chatGPT would have affected the ability to provide real time support and feedback to the clients compared to previous workflows?

id_4: Well, there's one thing that still, I mean, if you have to talk with chatGPT, I mean, so I imagine the scenario, there's the clients, I don't

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know, for example, talking real time on the phone and you have to give support, but in order to do that, you have to interface with a GPT that can be the fastest in the world, but you have to find the right prompts. Uh, I mean, maybe there's already a transcription tool during the call, so it's already imagined. So let's imagine that actually chatGPT, um, just takes the phone call without the, the human making, uh, like, um, and you can still interact with it. You can still interact with the prompting, but, uh, let's say transcribing the conversation. It's not really the issue. Well, yeah, I would say so if GPT is kind of, um, I mean, if it keeps context, if it keeps, um, um, you know, former, uh, problems that have been solved and so on, it may be a very quick way to, um, I mean, to give support to clients, but the only one thing that I, that I'm hesitating about is that chatGPT is still a very general tool, uh, that covers a bit of everything. So if you're have to give support for your company in particular and your products in particular, chatGPT may probably not be very specific.

Riccardo: So it would not really add too much value.

id_4: Yeah. In that sense. I mean, so, um, yeah, it would add value in the, in the time response for sure. It would be incredibly faster for, for, to give a support, uh, but maybe could lack again specificity, uh, because it is not, uh, it was not trained an AI that was trained for that company.

Riccardo: And if you were to focus on the interaction you would have with the chatGPT in this case, how would it then help you or affect your, um, like support and feedback, real-time support and feedback loop for let's say evaluating your best service to the customer, like, because you already mentioned, you already made use of it. Like you asked to provide feedback. The question here is a little bit more on if it's, if it can be called real time, if it is an enhancer and if you, yeah, if you would rely on it.

id_4: How can I help my own work? Right.

Riccardo: Yeah. How we can, how do you think, uh, to what extent do you think it can be called a real time support, um, and feedback specialist or like, um, companion colleague? Maybe comparing it to a human might help.

id_4: I was thinking that for example, let's imagine that you have to deal with some emergency or I don't know. So you're in crisis or emergency mode.

Riccardo: Yes.

id_4: And so there, there is inevitably, there is a emotional component, uh, and some, you know, crisis management that comes in and chatGPT wouldn't just be able to perceive the emergency issue. Um, it would be like an ordinary case. I mean, it wouldn't, I don't know how to say, there wouldn't be that human element of collaboration that you get with your human colleague where you both know that you're in an emergency, for example. And so there's some kind of empathy going on, which is, which is vital when you work, when you're in the workplace. And that's something that is, for example, missing as well with the remote working. There's a human component on the workplace that if you are just collaborating with chatGPT, surely the efficiency goes up incredibly time-wise, it goes incredibly well, but it would lack this interpersonal aspect. Uh, you can take it psychological or anthropological point of view. You can take it, but it's this interpersonal thing that you don't have to chatGPT, you know, and every time we had this getting, Oh, it seems like a person is talking to me, but it's not, it's not a person, it's

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a machine, you know, it's, um, so, and we, but still we tend to anthropomorphize it, you know, because we, because we kind of need it, you know...

Riccardo: We tend to even say thank you.

id_4: Right. Yeah. Oh, of course. I, I, I'm very polite with chatGPT, you know, uh, because, well, there's also the thing of, uh, you know, maybe training with politeness results in giving outputs, you know, as politeness, it once happened to me that, uh, I saw one of those racist outputs and I was like, no, please don't do it anymore. I think this, this would lack. Yeah. It wouldn't be able to cope with emotions dealing with particular, well, I mean, simply there would be no feedback on this. There would be no backup.

Riccardo: And you would say they're the most crucial ones when it comes to the creative process. Yeah. Especially, yeah. When you were, for example, in a, in a, in an emergency, uh, well, this scenario of the, of the tech support, I think it's, it's the most important one. Imagine there's a real emergency scenario, like someone gets stuck in a lift or, uh, I don't know, the, the lift got blocked and it risks collapsing. I don't know, something like this. And you have to react quickly with the people that are phoning from the elevator. I mean, that's a really, that's, that's really under pressure job for the human element that has to answer. And if he has to interface at the same time with a machine, it would probably be even more frustrating if the machine doesn't answer something useful. Um, I don't know if that's an interpersonal element that is missing that helps you also discharge a bit this negative emotion.

Riccardo: If we were to compare them on qualities that both can, um, sort of satisfy, I don't know, uh, you mean both trust, trust, uh, yeah, exactly. In this case, a colleague that helps you for providing assistance and chatGPT that helps you for providing assistance. So maybe reliability, trust, responsiveness, these kinds of aspects.

id_4: Maybe because for example, for reliability chatGPT is probably more reliable from any point of view. Um, maybe it depends on the colleague, but maybe expertise somehow. No, but no, I can't say that chatGPT has expertise. Oh, no, it's very difficult. I don't know how to answer this one.

Riccardo: You can take your time. You don't have to answer it now.

id_4: You mean a quality that they have the same extent, or it can be that, I mean, one has, has, I mean, both have it, but one more than another.

Riccardo: Yeah, both have it, but maybe one more. I mean, with empathy, with empathy was more one-sided because the machine does, I mean, you can say it has some type of empathy where it's like, I'm sorry that I don't know, you're coping with this issue right now. I can help you with this. I hope I can help you. Like there's some level of empathy, but it's, it's not real. Like you cannot really call it, um, real empathy. Right.

id_4: Somehow I would say, um, they, they both provide listening. You know that the other thing or person is listening to you and well, so responsiveness as well, if you want to, yeah, as you, as you said, yeah, they, they both have it. Um, but then responsiveness already is something that, but also listening, you know, they have it on different levels. I would say that chatGPT is probably time-wise more responsive, but from the listening point

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of view, the human has this interpersonal stuff that help, uh, decipher body language, um, context easier

Riccardo: And between the two, if you had to decide on who to choose for collaboration, uh, for this specific scenario?

id_4: So if that's a very general scenario, I mean, not, it's not emergency or stuff.

Riccardo: It's, it's your job. So if you are a customer support specialist and yeah, you have been working with a colleague maybe for the past three years, and now they tell you chatGPT is going to be the replacement. So what do you prefer? You're just a customer specialist, but you can give what you prefer.

id_4: think I would prefer the human colleague. It was very, very detailed interview. So I think that we touched, the questions were all very well put and made me think a lot. Uh, but we were talking about the, um, mirror watching yourself. Uh, we talked about chatGPT, but I have, I have maybe, I mean, the same feeling, if not even more with, for example, mid journey or DALL-E. Um, all right. Because the output is very, in my case, it's more focused.

ID_5

Riccardo Murciano: Awesome. Perfect. Okay, then we can go to the next section, which, yeah, are going to be the scenarios. So starting with scenario number one, I'm going to read out the scenario for you. And then we can go through the questions. So imagine you're collaborating with a multidisciplinary team on a complex challenge, creating an innovative product line for a company specializing in consumer electronics. The project demands expertise in industrial design, product development, software engineering, and marketing. Despite the diverse skill sets, the team encounters a creative roadblock and may lack in cross-disciplinary knowledge required for successful product development. To overcome this obstacle, the team decides to incorporate ChatGPT as a supplementary resource.

So yeah, first of all, how do you think this decision can affect the team's ability to connect these cross-disciplinary, seemingly unrelated concepts in the development of the product line?

It's basically, you encounter sort of a problem which requires cross-disciplinary expertise, right? So in this case, it's industrial design, product development, software engineering, and all, like more and more. The team you're working with goes against the creative roadblock, like they're stuck, and they try to make use of ChatGPT to overcome this. And I would love for you to think about how it can affect this decision, if it's positive, negative... Also, on what aspects in specific it contributes or it inhibits the creative process.

id_5 : Right, okay. Personally, I think it would be able to promote working together better, or like getting this cross-disciplinary knowledge to, I suppose, a higher level. Because I think that when, let's just put it this way, when you sort of, I suppose, if you combine ChatGPT with your own domain knowledge, I think the answers that you will get from ChatGPT are actually very good, or they can be, if you can prompt it the right way. And so I

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believe that there's some sort of synergy that can happen. And I also think that ChatGPT can synthesize a lot of the issues you might have, especially looking at it from different kind of specialties.

Riccardo Murciano: And so you think it enhances the defined expertise of the team?

id_5 : I think generally speaking, when we're talking about multidisciplinarity, the biggest problem is that most people can't really step out of each other's sort of comfort zones to sort of see what's out there. And I think that as a person using AI, you can get better at your own trade, but I think that it also helps other people who don't have your specialization understand it more. And I think that's what you would actually need to work together better. Okay.

Riccardo Murciano: And if you were to think less about the smooth working that happens inside the team, maybe more on the outputs or on what the end output of the development could be, how do you think, what aspect is being improved? Yes, we understood that the teamwork works better, they're getting a little bit more out of their comfort zone, but is there anything else?

id_5 : Well, again, I can explain it a little bit as a... ChatGPT can complete you there where you need it, whether it's the actual knowledge on the subject or whether it's sort of the team lacking or... So for me, I just always see it as like a supplementary resource that can actually also maybe be more of a, I would say, neutral body, so to speak. And ultimately, it really just does what you tell it to. So you also don't have to worry about the integrity of the work that you've done. Okay, awesome.

Riccardo Murciano: That's a good point. We're going to have another question about that later. Okay, so the second question is then, how do you think this interaction has encouraged the team to consider alternative perspectives or viewpoints that might not have been considered otherwise without the use of GPT?

id_5 : I think mostly into each other's perspective. I'm not sure if... and I think that: It depends on if it's prompted, right? Because is ChatGPT really sort of asked to really come up with a solution or how do we see the way that ChatGPT is being used as supplementary resource?

Riccardo Murciano: It's mainly used as a supplementary thing. So we're not testing now ChatGPT how it can perform human-like tasks, but it's more how it can contribute or inhibit the human work. So every single scenario that you're going to be seeing, it's humans working on the person. And then ChatGPT just putting... How has the interaction with ChatGPT encouraged the team to consider alternative...

id_5 : I mean, I think it could, I believe so because I think that as a human myself, I do know that when I am being creative myself or I have a viewpoint myself, I find it hard to maybe sometimes also let go of that point. So I often have to go back into my own creative spirit to think around in terms of something that might work. Also when there's a fallacy in how we think, even when we are being creative or we think we're being creative. And I think that sometimes there's a lot of scenarios you can make up for yourself, but I don't think you've seen all of the scenarios. And if by chance, ChatGPT offers you such scenarios, you might think, oh, this is quite interesting.

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Riccardo Murciano: The buzzword you just used, if you can elaborate a little bit more, you talk about a creative spirit. And you can elaborate a little bit more on that aspect and specific.

id_5 : Yeah, so for me, it's just one of those things where I write. So that's my creative part. I like writing. And I also, I do a lot of creative writing. So it's not...I mean, I will write sometimes also a blog post or two, but that's a different story. But my main creativity comes really in terms of crafting stories and specifically, for instance, crafting stories around humans, because I think that behavior is quite interesting. And sometimes when you're really sort of trying to find an angle, or you're trying to find a way to describe certain things or certain characters, and also sort of linking different stories within your story together, sometimes it becomes a little bit difficult because you, in your own brain, you understand the story because it's your story. But you also kind of need to think about other people's perspectives. So basically, the people who are going to be reading. Because when I write, and I have, for instance, a piece when I wrote it, and I won my prize, I got an interview on it. And someone told me, well, I really liked your story. And it was about this and this and this. I thought it was quite interesting because they had a completely different outlook than what I had when I was writing it. So ultimately, I do think that ChatGPT, considering it's also based on NLP, can actually sort of provide you more of a sort of idea of how people perceive things. And how you could use that in your writing to better it, basically, for instance.

Riccardo Murciano: So it sort of simulates what other perspectives could be.

id_5 : Yeah.

Riccardo Murciano: Maybe a little small question on this, just to conclude the thought. What do you think about the originality aspect of it? Do you think it's just something made up that is just already there? And you could have found it yourself on the internet as well, that point of view, that perspective? Maybe it's taken from someone else? Or do you think the generative aspect has made it something novel, completely new?

id_5 : I think it could be something completely new. But I do think that, and probably this is going to come up somewhere in another scenario. It has a lot to do with how you work together with it. So for me, if you ask ChatGPT, give me 10 ideas, it'll just give you 10 very, maybe... Straightforward. Straightforward, maybe uncreative, also, even answers. But if you can ask it the right way, it can actually help you. I must also add, though, that I haven't so far asked it to help me write anything, even to get through my writing block. But it's just something that I do know from...

Riccardo Murciano: What do you use it the most for?

id_5 : So far, I've used it for... Especially with regards to education, actually. So currently working on a project related to, for instance, augmented reality. So I'm asking it to help me script that. So in terms of writing, I suppose that would be a thing. But it's not a personal thing. That's more of a work thing. And basically, it helps me synthesize some information that, personally, I find difficult to link. So, I mean, you speak about videos. I have a lot with writing, but I'm the kind of person who has a lot of different ideas. So sort of tying them together to really get something nice doesn't really happen.

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Riccardo Murciano: So to conclude this scenario, I have a third question. So, I mean, but we already kind of covered it. So maybe if anything else comes to your mind, feel free to share it. How might the team's ideation process evolve over time as they continue to use ChatGPT as a supplementary resource for future projects like this one?

id_5 : Can you elaborate on that question?

Riccardo Murciano: So if we were to think about this creative roadblock as something where they need to find a new way to overcome it, how do you think by continuously using ChatGPT as a supplement can, let's say, affect this process of coming up with a new idea? Does it help it? Does it not help it? Is there a pattern of evolution in that direction? What things come to your mind as you were to future project it?

id_5 : What comes to my mind is on the first level, yes, because I think the ideation process kind of tends to be very long, I think, especially if you're really... We're talking here about a cross-disciplinary or multidisciplinary group of people. I think that oftentimes, especially if I can relate it to my practice in education, a lot of people sort of have all these opinions on things, which doesn't always allow the ideation process to even flow. So it just sort of starts at the beginning with people maybe disagreeing or maybe a few people agreeing, but never really reaching a consensus. So I think in that sense, it can be very helpful to sort of, I suppose, break through that kind of process of being stuck or stagnating somewhere. On the other hand, I feel like it could also kind of ruin the ideation process, because when is it an ideation process of yourself and of your team, and when does it become the one of ChatGPT?

Riccardo Murciano: Exactly.

id_5 : So does it just stay a supplementary resource, or does it just become your kind of easy go-to place every time?

Riccardo Murciano: What you rely on. Yeah. So you think maybe in the short term is more of like a boosting thing, but then in the long term, there is this danger of it just evening out the creativity curve.

id_5 : I think we're in the process where we're currently using ChatGPT because it's learning from us. So we're providing it with more prompts and more ideas, and we're asking it also, obviously, for ideas. But a lot of the current, I think, work that we're doing is a lot sort of prompting into new things and making it understand, I suppose, sort of developing its whole natural language process and understanding itself. But then also, it's like, so I feel like it's kind of, we're teaching it. So when does it become that, like, it starts teaching us and that we no longer maybe even have a say in what it is that we are learning from it? So I feel like that's kind of my take over life.

Riccardo: I mean, on this, you could also discuss why they're not releasing GPT-5, right? Because of the whole AI-generated inflation.

id_5 : It's hinting towards a multimodal model, basically, yeah. So you can see that there's a lot happening. And I think that releasing GPT-5, I mean, obviously, it's going to just be sort of four on Adderall. And then the question is, so when we're talking about working together with ChatGPT, I think that's the sort of thing, or any other generative model, by the way,

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is that it should always remain a thing of sort of working together and really sort of reaching some kind of synergy.

Riccardo: Yeah, because as soon as you, as a worker, give it the ability to, like, conquer your job, then it happens. But if you use it to tame it, then it can improve. Yeah, no, I agree.

Okay. Scenario number two. This one? Yes, okay. So different scenario, different aspect.

As a creative designer, you're tasked with designing a new logo for a company's upcoming service launch. You recently discovered that ChatGPT provides you with a context-based response and could retain information from your previous interaction, which you believe would help you streamline your workflow. Your main priority is to address all the requirements provided, but you find it challenging to keep track of everything, every requirement, without losing focus on your creative process. So with this scenario in mind, in what ways do you think ChatGPT helped, affected you to better address the client's requirements, while still maintaining focus on your creative process? I can also provide you with an example. And in this case, designing a new logo for a company, the requirements could be that maybe you cannot use a certain color, the shapes have to be in some way. And I remember you used it for designing a fashion collection?

id_5: Actually, I also got it to ask, I prompted it to prompt a logo designed for me.

Riccardo Murciano: So, okay. So keeping all kinds of requirements, maybe to keep track of everything, it's difficult. And you think that this capability of ChatGPT can help you, or maybe you think it's not developed enough. It doesn't help you, just your imagination on this one.

id_5: Well, I mean, I think this is sort of, I don't know if this is a problem with technology, to be honest. I do know that people, of course, like when they want a logo, they have a sort of specific idea of what they want. As a creative designer, I think the question is always like, do you feel like you want to sort of go with exactly what they're telling you to, or do you want to really be creative and create something that you really feel would do the company or the brand right?

Riccardo Murciano: Yeah. I mean, that's complete freedom. Unfortunately, that's not always the case. You need to sort of keep some requirements, guidelines.

id_5 : But I think that, yeah, sure. If you do feel like you want to use ChatGPT to really sort of help you, what would be a context-based response?

Riccardo: It's just the general way that the ChatGPT provides you with the answer. So just the answer, basically. It's just built like this. It's like little introduction, context, and conclusion, right?

id_5: So you just decided to sort of maybe use it to, okay, okay, wait. So I think there is ways in which you can focus on your creative process. And I do think that if you prompt it a certain way, it will allow you to, I suppose, still stay compliant with the requirements of your customer.

id_5: So what do you mean by, for instance, what you find it challenging to keep track of everything without losing focus? So what do you mean by that?

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Riccardo Murciano: Because let's say you're focused on making a good looking logo with your creative ideas, but you also need to keep in mind what you cannot, or you can use, right? You don't want to maybe think about them actively. You want to have a ChatGPT taking care of it. And then you can continue like providing him with, I don't know, your ideas, your next design. You can also already imagine how it would be with the multi-model model. So it understands better on, you know, understands better on how the design looks like and everything. So it's like, it's as a tool, like I'm asking you if you use it as a tool to have a sort of, to say the bigger picture of what you're doing creativity wise, if it helped you.

id_5 : Yeah, it does. Because for me, yes, because I do feel, okay, I think I'm just, again, this is my yellow energy. I do feel that generally speaking, when you are being creative, this is something that I also kind of had when I was at some point contemplating becoming a copywriter some time ago. I think when we're, because what we're seeing a lot, I think also in sort of the real world scenarios that a lot of people who are in the creative business or industry tend to be, I would say, independent contractors, or they're working on their own. So what do you mean by, for instance, what you find it challenging to keep track of everything without losing focus. So what do you mean by that?: So they're like, you know, what we call is it they're here in Holland. But one of the things that like, I think a lot of them find very difficult in the conversations that I've had with people as well, is that how do you sort of streamline the whole idea of all the things that you need to do on a step by step basis, and the actual creative work that you do. So, you know, administration is a hassle. But also just if you really think about it, if I were to be someone who was creating logos, maybe, you know, I'll have 10 different clients. How would I structure that? As a creative person, I'm just very good at making logos then. But maybe I'm not very good at like, sort of streamlining my workflow in general. So I could definitely ask ChatGPT to streamline that for my for myself as like a step by step approach, in order sort of to see how it's going.

Riccardo: I'll turn the second question into more of a question, which drifts away from the scenario. So it's in your, in your experience with ChatGPT, if you've ever used it, or how do you say? All right. Think about the conversational aspect of it, right? That you have the conversation with, with AI, you're in ChatGPT. And yeah, you know about this thing that keeps in mind your previous interactions, right? I wanted to ask you if you ever use this, this capability itself, if you take advantage of it, and how, on what level it affects your workflow? Yeah, how this conversational aspect and the fact that it sort of remembers what you, what you prompted before. Yeah, how it affected your workflow, if you even use this, this capability of ChatGPT.

id_5: Yeah, definitely. Actually, yesterday, I was, because I've been working on designing a course, and I'm doing this with a colleague of mine. And we, we're both kind of both very creative people. So when it comes down to the whole idea of streamlining our thoughts and stuff, that's a little bit difficult. So we tend to sort of bounce off of each other, but nothing really concrete happens then. So I've used ChatGPT for that to actually sort of like, I entered my ideas, or I entered our ideas. And I sort of asked it to help me sort of make a whole out of the situation. And the thing about conversational AI, what I really love about it is that, you know, like how sometimes, I mean, I don't know if that's the case for you. But let me just like, keep it at my own, I suppose, experience. I have this ideas, like, I

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have a lot of ideas. So to it, because I think the last time we spoke about this was two weeks ago, and I hadn't opened anything about it in two weeks. And when we opened it yesterday, I was like, Oh, shit, I kind of forgot what we're, you know, even talking about. So I go back into the conversation, and I asked it an extra question based on something that we still needed. And it still remembered what it needed to do. Which was great, because it saved me what I think usually what happened is, okay, I've left this sort of, you know, shelf for two weeks, now I have to go back and read everything and then start rethinking the process. So it helps really sort of, I suppose, staying real time with your endeavors, so to speak. That's the way for me, it hasn't kind of influenced me in that regard. So I enjoy the fact that it basically, it's kind of like a time vault of all my ideas. And I can always go back and think, Oh, well, you know, this is where I left off. Okay, so I still have all this information. All I need to ask is maybe some questions, and then it will reply to me what I've sort of thought of before.

Riccardo: And also from your educational aspect, I assume you see the patterns of how it can be helpful.

id_5: Yeah.

Riccardo: Right to go to the last scenario. In this case, yeah, we're focusing on ChatGPT helping out the customer support specialist not taking over his job. But we already cleared it before. But here it's, it's more than ever. So yeah, you're a customer support specialist at a tech company that provides software solutions for small businesses, usually by phone, imagine like a sort of a call center scenario. Your role involves assisting clients with troubleshooting issues, answering inquiries, providing guidance on how to use the software and so on and forth. To help you manage this high volume of support requests and provide real time assistance to the clients, your company has implemented ChatGPT plus with its rapid response feature of the 3.5. And the goal of this is to enhance the quality of the support you provide while reducing this response time, which is valuable for this kind of job. So yeah, I want you to reflect on how this ChatGPT plus capability might have improved your ability to provide these real time support and feedback to clients compared to workflow without it.

id_5: Yeah, okay. I think it's, it's nice to, I mean, I think it could improve in the sense that it can mimic or reflect the No, actually, maybe not mimic or reflect. But I think it's sort of adds to the aspect of how you do give feedback. So usually when you're just doing your job, and if you're just, if you're going to have a lot of inquiries, you're going to have to answer a lot of questions at the same time. It doesn't exactly allow you very often to sort of have a lot of time to really think of maybe the most, I would say, politically correct way of answering certain questions. And I think that when you're dealing with these kind of things, it's, I suppose, easier when you are using ChatGPT, because it can really sort of take on any tone of voice. So I asked it last time to provide feedback for my students. I mean, I was just trying it out, actually. And it helped me. And when, and actually, it was better at feedback than I was, because, well, I have a lot of students. So if I have to give very exact feedback, that takes me a lot of time. It doesn't allow me to really think about the tone of voice of really giving, I suppose, the type of feedback that you want to give that's also maybe very constructive for students. And you can actually prompt it to do it in a certain way that compliments the question of the person that you are dealing with. So I think that it does that much better than humans do, because it has time. Allow me to really think about a ton of voice: And it generates

everything within seconds. And it generates everything within seconds. And you, for you, it would probably take a few minutes, at least, to really sort of think of how to reply to an email or how to reply to a chat or...

Riccardo: And "always keeping in mind the conversational aspect" of it, how do you think that, in specific, can...

id_5: I think the thing with the conversational part is a bit of like, I suppose, I would call it fine-tuning, although technically fine-tuning is used in a different way within AI and generative AI. But I think you can really sort of... I mean, see it as a catalogue, basically. You basically tell it some, you give it some information, it gives you an answer to that, based on what you've asked it to do. But you're not happy with it. So you can add a few more words to make it sort of sway more in the direction that you might want. And you can actually reiterate that every step of the way. And you can even, at some point, say, well: "hey, I now have a new scenario. I want you to go back to... I want you to go back to the second tone of voice, maybe. Because it will remember that. And it makes it a lot easier to sort of switch back and forth in that regard. All right. So that's definitely an aspect. That's been my opinion so far, yeah. Okay, okay.

Riccardo: So if we were to connect it to the first scenario, just the aspect of it evaluating different points of view, how would that affect your process here of, receiving maybe a loop of feedbacks.

id_5: I think this is going to sound a little strange, maybe, because obviously we're dealing with a computer here. But I think that the AI in itself, of course, has already been trained on humans, on our type of language, the natural language processing, and all of the sort of interactions that we've, well, I suppose the data that has been trained on has been very human. So it can mimic, for now at least, because we shouldn't use the same tunes or whatever, but it can mimic very well how we see emotions. So if you ask it a specific way that you want to say something, then you can do that. For me personally, I think that if we're talking about multidisciplinary and maybe even working together, or like collaboration with colleagues, whether it's different teams or not doesn't really matter. I think that a lot of, I would say, conflicts arise by ego, which leads to people sort of always thinking, but, you know, I'm this person and I know better. Or, you know, you have these kind of sort of scenarios always happening and sometimes maybe even sort of undermining each other, which is not a good thing when you have to provide any kind of teamwork. And I think that if I could sort of speak for myself, I'm someone who for a very long time when I was younger, I suppose, I was very, you know, sort of hotheaded. And then, you know, if someone would sort of do something that would, like, you know, that I wouldn't like, then I would be really angry and I'd really sort of have this moment. So, you know, obviously in professionalism, you grow. So I've come to become a lot more calm, but I still do have this idea of feeling personally offended. And I always wonder for myself, how can I voice things in a different way? Because feedback, I think a lot of people don't really enjoy feedback to begin with. So we do keep talking about that. But when we're really talking about feedback, a lot of people sort of perceive it as, oh, you know, here it is, someone's going to come and attack me. And I think that's like an overall idea that we generally as human beings have, there's nobody who's like, oh, well, oh, thank you. You know, thanks for actually sort of putting my mind to that. I mean, I'm going to really think about this, you know, interesting that you've mentioned this. So we miss, I think, the objectivity ourselves, which I think doesn't allow us to really receive feedback properly.

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But I think that because this whole idea of conversational AI, you can actually get it to the point where people are really accepting of it, because it can mimic so well, different kind of styles of doing it with actually the requirements, as we maybe said earlier, but the requirements of how you want it to be and what kind of outcome you kind of expect from it.

Riccardo: So I think a human would then evaluate with a more objective way of feedback coming from

id_5: I think so. Yeah. I think a human would then evaluate with a more objective way of feedback coming from...

Riccardo: Because the whole ego thing is not like that. No, it makes sense. Makes sense. Yeah.

id_5: Yeah. I think the objectivity ourselves, which I think doesn't allow us to really receive feedback properly.

Riccardo: : I mean, you could also maybe you could also argue it the opposite way. I mean, I'm, I'm not the one being interviewed here. But at least in my, in my experience, there's, there is definitely people that tend to hate on AI as output. So they it's, it can also be argued the other way around. I mean, with some people, that they care even less about the feedback coming from AI.

id_5: But yeah, I mean, no, honestly, I mean, I tried it out. And to me, it was really kind of interesting, because, like, I mean, for me, feedback is very difficult. And I think as an educator, we always struggle with that. Because, you know, you're continuously giving rounds of feedback to your students. The question is, what do they do with it? Do they really thoroughly understand what you mean, even? And do they understand?

Riccardo: Because if you see it as an attack, it's exact opposite.

id_5: Yeah, not even just an attack, they don't always really understand what you're trying to say with your feedback. And what steps are to be taken next to really, especially, I suppose, like, you know, the younger students, I mean, I would say, like, the older they get, the better they get at it as well. But so I think that's the sort of, so that's kind of the thing. And it's not just, it's not just on the end of our students, by the way, I do believe also that we as humans, and even me as an educator, I feel like I'm flawed enough to be able to say, I'm not sure if I can give feedback very well. And because that's something I'm lacking in. I would much prefer having a system that can help me improve that because it's also a learning curve for me. And I think that that's where you really sort of get to the, like I said, the synergy of things. Like, how do you make sure that you work together with it so that it becomes a better system and you become a better human?

Riccardo: Awesome. Awesome. Yeah, makes sense. Makes sense. You added a lot of content to the scenario. Awesome. And then, yeah, I mean, we already sort of talked about it. But if you were to think, like, in the scenario of this job, that this person has been working together with a colleague for, let's say, the past three years, four years, a very smooth working. And out of nowhere, yeah, instead of the colleague, there's ChatGPT. If you were to compare how his workflow changed from, yeah, colluding with a human colleague to having ChatGPT instead, let's say, for instance, that the management decided to replace him somewhere else. So he's now taking over alone on this

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type of job. How do you think it could have changed or affected his creative workflow in this case?

id_5: Sorry, I think you're going to have to repeat it again.

Riccardo: Yeah, no worries. Imagine you, as a customer support specialist here, you are working with a colleague, with another colleague, having this whole feedback loop with this person to assist your clients. And hiring management just says, yeah, Bob is not going to be working with you anymore. We need to place him somewhere else. Now you have ChatGPT Plus. Work with it. If you were to compare the two workflows, how do you think they could differentiate?

id_5: I mean, personally, I mean, at the end of the day, you know, I do teach business administration. So when it comes down to efficiency and such, I do believe that is, because I don't necessarily see it as a replacement. I still see it as a support thing, right? So it's not as if you're getting rid of every person in customer support and telling the ChatGPT to do things for you.

Riccardo: We're not talking about the replacement of the human, we're talking about the workflow, how it changes, right?

id_5: I'm just wondering though, in how far do customer support specialists really work together on these kinds of things?

Riccardo: Well, it can be that one is not really adhering to the conversation actively, maybe it's in the background, and just providing you with some information, some ideas on how to overcome it, and the other one executes it more. Or maybe there's different sessions apart from each other, where they have to work together to find a solution. I mean, it's kind of broad, so you can think of it in many, many...

id_5: Well, I think I don't necessarily think there's a problem with that. I think as long as you always have someone in the background that you can always ask questions to, that is not the machine, I would say. Because I feel like sure, you know, it's fun and all, there's a lot of creativity that comes from chatGPT. There's a lot of pretty good knowledge that comes from chatGPT. There's also a lot of very faulty knowledge that comes from chatGPT. So we've spoken, I mean, you know, the world kind of speaks about hallucinations, although technically they're more fabrications. So chatGPT also just sometimes says the wrong things. And I think that like maybe sort of the job then doesn't really become, okay, assist me in really helping me answer these questions, but more so, is this still relevant? Is this correct? And are we still on the right path when it comes down to this?

Riccardo: And a human would do that better, you mean? For now, yeah.

id_5: Well, it depends on what human, but yeah, I think that if you are an expert in your field or in your domain, then yeah, you are much more likely to see the mistakes or the things that aren't true.

Riccardo: Awesome. And maybe other aspects, if you were to compare the two workflows, so we understand now the information integrity as a point, maybe some other aspects.

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id_5: Well, yeah, but I also think maybe also, but not just, I suppose, not integrity only, but I also think that when it comes down to, this is one of the things that I'm kind of worried about for the future as well, when it comes down to generative AI or maybe AI in general. I mean, we've already seen this a little bit with social media, I suppose, where people are feeling very lonely, feeling very much just sort of stuck to their phones, maybe on WhatsApp, on Snapchat, Facebook, I don't know, whichever. And I think that that sort of also kind of takes down like a bit that idea, because when you, because I think work also, aside from, I do think, and this is something that's very businessy as well, we, people, or I suppose your boss always sees your work as you being extremely good at your job and being very efficient at it so that you can maybe spend even more work doing even more work. But I think one of the big vital aspects of the job, I think, and for me, as someone who's always valued this the most in a job, actually, is the social aspect of things. So I think aside from really the information fallacy or whatever you want to call it, I think not having an actual human that you can have, make jokes with, or engage with in general, I think that could also just be problematic, also within your job and within the quality of the job that you provide.

Riccardo: I see. I see. No, that makes sense.

id_5: Because it forms a, you, when you're working together, certain things, and I remember I used to work in a place where I met two other girls, and we were, we were very unhappy about our job at that point. But it was our common denominator. Our job brought us together as three people. But the fun things that we did do was talk about it. And maybe sometimes also find the job not very fun, but a way to sort of, I suppose, socialize around it, which made it a lot more bearable. So I think that's a very, for me, anyway, at least a very important aspect, but I think also for the rest of the world. Because I do think that when you're, like, when we're talking about interactive AI, especially if you can prompt it the right way, it can give you such pretty human answers. And it can really sort of engage with you as if there's literally someone on the other end of the chat, like, as if I'm literally talking to a human being. But it's not a human being.

Riccardo: No, of course, of course. I mean, we're not there yet, right? It's not that good at simulating. Okay. So if I were to wrap it up, you think it, like, on a large scale, this process is more pleasant, it's more healthy, as if there's a human working with you. But maybe you see it as more effective and fast with ChatGPT. So that's the way to wrap it up?

id_5: I would say so. Yeah. And I think if I would add to one, like, add one little thing, I think it also kind of depends a little bit on when we're talking about the future of work, and maybe the jobs that will become obsolete, etc, etc. I don't necessarily see it as necessarily only negative. I do believe that there's also better ways that humans can be used to do jobs that are better suited for them.

Riccardo: I mean, if you if you were to do the cheesy comparison that, yeah, there's no back in the days in the industrial revolution, like there, there were people actually like moving stuff in a very repetitive way. I guess now, it's the same sort of thing. But when it comes to like, mental, repetitive stuff,

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id_5: definitely, on the service level, definitely. I mean, I've seen jobs that pay a lot of money for really sort of, you know, tasks that to me are like, I don't know, like, I don't, you know,

Riccardo: call centers.

id_5 : Yeah, for instance.

id_5: Yeah.

Riccardo: It's torture.

id_5: Yeah, it is.

id_5: So you know, what, what if, you know, you could go ahead and do something that's a lot more fun? Provided you want to, of course.

Riccardo: Yeah, definitely, definitely. I mean, we're, we are perfect on time.

Riccardo: Maybe, maybe just the last one on this scenario. Do you how did how for your experience? When ChatGPT was only free was kind of slow. If you and if you were to compare it to now, I assume you have ChatGPT plus.

id_5: Yeah.

Riccardo: So to the fast model of 3.5, how, how that changed your workflow, if there's a way that it changed it, like the fast response, right? Almost Google like speed.

id_5: I mean, to be fair, I'm not entirely sure if I thought 3.5 was necessarily that slow. Oh, no, no, wait, that's actually no, actually, technically, the plus is slower. I think that's what they keep saying. Because it needs more computing power, from what I understood. But it does give you better responses. I think that was like the difference between the two. But you know, I'll have to sort of check, like fact check this because I'm not sure anymore entirely. The previous version didn't really allow you to like, at some point, it was like, okay, that's enough. This is all you can do. And then you'd have to start a new chat. I don't have that as much with the plus version currently. But in terms of speed, I feel like it just sort of really spewed out the answers really quickly. And I think the biggest problem with the plus is that I do pay for it. But I do feel like very often, there is some issues there because server is still sort of blowing up. And I think at the beginning, the whole idea was that there's like sort of this vast amount of conversations you could have. And currently, you know, that's sort of stopped to 25 messages in three hours, I think.

Riccardo Murciano: Yeah, there was there was a period.

id_5: So I do have moments where when I sort of exhaust my, my plus, I go back. There's 3.5. Yeah.

Riccardo Murciano: I gotcha. All right. All right. All right. All right. I think that's that wraps it up. Yeah.

ID_6

Riccardo Murciano: We can already dive into the first scenario, and before we get into it it's gonna be 3 scenarios, and in all 3 we're gonna be using conversational journey to the I and no sorry chatGPT. Okay, you take your time. Take your time, really like, just read it maybe twice. you are collaborating with a multidisciplinary team on a complex challenge, creating an innovative product line for a company, especially in consumer electronics. The project depends on expertise industrial design product develop and software engineering, marketing. despite diverse skill, set the team encounters creative roadblock and may lack across to overcome the obstacle team size and corporate chatGPT. Supplementary resource. Okay. How has engaging with chatGPT Affected the Team's ability. How has it?

Riccardo Murciano: You would think you could maybe think in general how oh, how much activity would affect so either contribute or make it more difficult or the team to overcome this roadblock.

id_6: Well. I would look at ChatGPT as kind of as somebody who's intermediate any intermediate skill level on almost every field and I i'm willing to bet that it's smarter than 60 % of the labor force. If you talk to a software, engineer. ChatGPT probably knows more about the general field than that engineer. I'm not saying it's about as engineer. I'm just saying he's probably specialized in this in a single you know. Ios app, for example, how to build those and how to build back ends versus chatGPT They will be able to answer. You know what's the difference between. I don't know Ruby and Haskell. Most people. Don't don't care would never care what ever study that the chipt will know, because it has that the broad knowledge base. And so for for a team of people who some of them are specialized in the narrow field of design, some of them specialize in narrow field of software engineering. To have that tool, assuming that everyone uses it correctly would give them the kind of the breath of knowledge to be able to ask questions, hey? Would it be possible to have a a blender with chatGPT built in? And the answer is, No, because you would need a an Internet connection. Probably you don't want to put a wi-fi, you know, sensor or wi-fi a chip inside the blender, because it will be too expensive people want their blenders cheap blah blah blah! So it would be able to make those kind of very quick calls about ideas that won't work and they would also be able to brainstorm ideas that would work, incorporating all those aspects. Now it takes a great deal of no well, not knowledge, great deal of practice to prompt it correctly. We need to explain the rules that you need to fulfill. In this case, for example, the budget of the consumer electronic would be very important, because, depending on the budget there, it will severely limits what you can do. Also, there's a big good trade off between making it more complicated, and and making it less reliable, or reliability and and complexity kind of trade off. So you'd have to know which one you're going for. I think a lot of people tend to favor things that are more reliable and less complicated rather than you know something that has 12 screens, and 11 of them Don't work.

Riccardo Murciano: of course. perfect.

id_6: so connecting me seemingly unrelated concepts and disciplines. so I would say, just giving everyone a tool to brainstorm with and troubleshoot with. That's the first thing I can think of. I guess it would also be able to whatever concept they come up with, they can evaluate it. I've also heard this might be interesting to you. I've heard some cases, or some stories. Let's say some more. What's the word anecdotal evidence that you can use chatGPT to do market research. So say you're making a blender. And you would

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ask, hey, would Dutch people like this blender and you can actually tell chatGPT Hey, You're pretend you're a Dutch guy, you know, 30 years old. Would you like a blender that can you know, blend bricks or something. and it will be able to pretty well-accurately give the answers as that kind of person would give and that's super useful in evaluating. So when we we would have a hypothesis, say people are going to buy this blender, you could kind of synthetically evaluate that hypothesis with chatGPT, which is a pretty interesting approach. In my opinion. I am not going to vouch how well it works, but certainly it's helpful. Maybe it find some kind of argument or drawback to your product that you didn't think of.

Riccardo: Second question, how has the interaction with chatGPT encouraged the team to consider alternative perspectives or viewpoints that might not have been considered otherwise? So how would the interaction with encourage the team?

id_6: One thing about chatGPT specifically. chatGPT 3, I should say, because I I've I've played around with the fourth one, but it's super slow, so I usually use the 3.5. It's. It's very compliant in that if I if I told it, hey, i'm thinking of making a car and made of jelly beans, it would go. That's a great idea even though it's clearly a preposterous idea and so encourage encouraging the team to consider alternative perspectives. I think chatGPT will tend to agree with whatever they propose unless unless you specifically ask it to brainstorm or to give alternatives. So unless they specifically asked to brainstorm and give alternatives, I think they're going to learn very little from chatGPT, because it tends to be very compliant and very agreeable. So it's it rarely criticizes, unless it's like a piece of code, and you put in 2 plus 2, I equals 5. Then it might gently suggest: You might be somewhat wrong there. Consider, you know, reconsider your proposal, but another in you know, in most cases it doesn't really offer a lot of alternatives unless you specifically ask it to do so. So it's it's a difficult question, though. On whether gpt encouraged... So Gpt itself won't, encourage anything unless the people are exploring alternatives. The Gpt. Is unlikely to give them that. Okay, Number 3.

Riccardo: How might the teams? The ideation process evolve over time as they continue to use chatGPT as a supplementary resource for future project?

Riccardo: Still to for the rough on question number 3: in the long term focusing less on the the actual chatGPT and more on how the creative process of the team...

id_6: So the answer is, nobody knows, because we haven't seen what happens. We have seen what happens with tools like Photoshop. You might think it could make people less creative, or they would make them lazy somehow, or something like that. But I I don't see that that's what happens. I think people are motivated. They they get extra productive. I've seen it myself with myself. I get more motivated to build something cool, because it's now much easier. So it feels like, hey? I'm making this great progress. So so let's let's keep going, you know? But I don't doubt that there there there will be people get lazy who get less creative instead of thinking on their own, they will ask the BoT. That's that's true. But I think... I mean, it's the same with Google. There's there's people i'm sure you've you've You've had those people who send you an essay on topic ABC. And you look at on Wikipedia and the exact same thing. Copy paste. There's people so there's people like that who are just lazy, but I think they're also Usually they're lazy on specific subject,

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and they're much more creative, much more driven on another subject. So I don't think there's anything special about this tool in terms of how it would change people's behavior. That's my feeling on it, cause cause there's

Riccardo: so you're saying in the long term like a a change will not not even be present. Or you say like, because you mentioned productivity and motivation.

id_6: How would the ideation process evolve? I mean, it would give a very powerful new tool to generate new ideas to validate your existing ideas. and that's cool. But fundamentally.

Riccardo Murciano: Do you think that's gonna like the ideation process of of the team without chatGPT? Will the them be more trained or less trained after a long like use.

id_6: How do you define the word "trained"?

Riccardo: trained as in you're able to find new ideas for having better performance

id_6: for having better performance, you say

Riccardo: We could say it like that, yes

id_6: So I think performance and productivity would be way better. Yeah, I think so.

Riccardo: Also, without the use of it. Right?

id_6: I think, with chatGPT performance and productivity will go way up, even for people are not driven, are lazy because they are able now, with very little effort, to get very good results, so that alone will, you know your lower tail in your distribution, your lower tail of really crappy, unproductive workers. Their productivity is going to move up because it's so easy to get much better results. So that will move the average way up, because, of course, the the tail tends to drag the average down. I think that's true, but your top performers. I think the whole graph would slide to the right. I think the whole team, or the whole, you know ecosystem would be more productive.

Riccardo: Maybe just shift a little bit from this scenario in your personal experience you can also like, be very.

id_6: I mean, that's that's what I can comment better on, because I don't know what's gonna happen in future, I can't tell you.

Riccardo Murciano: So in your experience more in specific, where do you think you benefited or did not benefit from chatGPT, as let's say, an ideation and like helper, because I I don't want to talk about replacing your ideation process, but more like how it affects your ideation process when you maybe I mean that creative like that one.

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id_6: Let me tell you, kind of a joke to illustrate it. Me and my friend JP we work together. He's a designer. I'm. A developer and whenever now we have a problem, we don't know what to do. We say we're going to go. Ask the boss. and then we go and ask chatGPT Turns out that it knows pretty well how to handle situations where we have no clue what to do and I've I've had a lot of cases now where the consoles pew out some error. There's a permission error on file, etc., whatever it is. and I can copy it into chatGPT and ask, hey, what's what's the issue here? And it gives me very competent answers. It sometimes even gives the full solution. And so for me personally. it made me way way more productive in terms of being able to write code. not so much design with design. I'm struggling, but but the writing code it's very useful. Writing, like well, not blogs, but things like, you know, paragraphs and stuff. Sometimes you need like quick explanation for something somewhere. It's not as useful to me personally, because usually the paragraphs are right. They're not quite right to what, unless i'm super lazy, and I copy them in. But with code. The beautiful thing about programming code is there's you know very well what's the right answer, and what's the wrong answer? I started with my. I started with my experience with the marketing and in marketing you don't know what the right answer is. and even when you launch the campaign you don't know what the right answer is, and even after campaign finishes you don't know what the answer is. but with code it's much more mathematical. Either it works or it Doesn't. And so and so with chatGPT, you can play. You can kind of prompt it until you get a right answer versus with copyrighting, and you can prompt it all day long. And you know you don't know what kind of answer you got for that reason in in when i'm coding. It's super super useful, because I can always get the right answer out of it. I mean almost always. unless it's... the the biggest problem for is the scope. It's not able to understand the whole project, and what the CEO wants, and what the database is like, and what the old app is like, what the bugs are, what the users are saying it doesn't have that breath of kind of understanding. But when you give it a very specific, narrow problem it solves it very well. extremely as well. I've almost never seen it fail to be honest with you. So in my personal process it's it's made me hugely more productive and it's made me be able to solve problems that would take me hours otherwise, or I just don't have the skill set, or I don't have the understanding if it's like an ubuntu operating system problem. I don't know much about. Linux no, nor do I want to. But I very often have those problems, and now I have. Like a specialist I can go to, and he goes. Yeah, just like that. And it's done. And I can move on what i'm what i'm good at is the application layer, you know, and stuff like that.

id_6: They're very, very open questions. I have to say. These questions are impossible to answer. But okay.

Riccardo Murciano: that's the point. That's the point. It's a it's an endorse, a discussion not to have black white answers

Riccardo Murciano: It's the closest we can get. It's also like they creative studies and themselves they're we. It's really difficult to make them concrete, so that's the closest we can get, I guess.

Riccardo Murciano: So, scenario number 2...

id_6: I'll read it over that's good. Yeah. As a creative designer, You're tasked with designating a new logo for a company's upcoming service launch. Okay, you recently discover the chatGPT provides you with context based response could retain information. If you have previous interactions which stream my workflow. Your main priority is to address all the requirements

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provided, but you find a challenge and keep track of everything without losing folks on creative process. I'm. Not familiar with the situation, but okay. In what ways has chat cheap? So in what ways will chatGPT Affect your task whilst addressing the clients requirements while maintaining focus on creative process.

Riccardo Murciano: So here I want you to focus on the on the tool of security of you know, keeping sort of in mind like you said with the coding. Basically, when when you want to for the tailor, your codes to satisfy your

id_6: So what i'm thinking of right away is chatGPT in its current form is not able to analyze or generate visual assets.

id_6: chatGPT 4 and its plugins are now getting really close where you can give it a picture. It can turn that into text, and it can analyze it, and then it can kind of say something about it and they can also generate prompts to then prompt DALL-E.image recognition / generation tool, so it can generate an image for you. I'd say DALL-E is really crappy when it comes to Logos. It's much better, I think, on things like in like something like a picture or something like a like an artistic picture. It does very well when you tell it to generate me like a banner for an email or a logo. It's not able to write coherent text, even if you tell it exactly what to write. I mean it's a it's a lot to ask. It's not like I'm complaining. I'm just saying it has its strong sides, and it's weak sides to and generating Logos. It's definitely its weak side. Anything with text, It's quite bad at so chatGPT would certainly not be a good tool for this task. I don't think, because cause

Riccardo: In this case, like the you're not using chatGPT to design this logo, but it's a to aid you, in giving you ideas

id_6: Okay, let me explain. So I I have used chatGPT for creating, branding. and it's good at generating a names for a business. For you can say, hey, we a a recent example. We have a dating app which is like tinder, but it has like mentors, so the mentors can help you, you know, be better, and they can help you select matches, and they can swipe for you, and so on and then we need a name for that. So we need a name for this. We want something classy. We want something that is a short. That sounds good. That's easy to pronounce easy to from your pronoun station to understand how it's written blah, blah blah! And we actually had a very long brainstorm between, you know, real people and we came up with the name courtly and chatGPT you after like 3 or 4 prompts also came up with the name courtly. which I was kinda like, but that's pretty cool where I mean the other names are crap. Obviously this is very subjective, but you know, in my opinion it came up with a really good, a really really good name so, and a name is a big part of the logo, in my view, at least. And then the second thing would be okay. What should be in the logo? Should it be a couch? Should it be deer, should it be a car, you can help, you can prompt it. Okay, what kind of symbol should I use for this? For this industry? For this kind of product product? It does very well with that as well. It understands symbolism. It can, you know, put things together in that sense. even if it doesn't understand anything about the visual stuff. It can understand the kind of the context of it in the principles of what? To what to mean, what what means, what in terms of language. But you can transition out to the visual visuals and with colors. I'm sure it would do very well as well if you ask it to give me a color that is, you know, symbolizes trust and safety, and also, you know, also relationships and stuff. You'll probably go like oh, you know, red and green, because red is, you know, for passion. Oh, sorry, red and blue reds for passion blues for like

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stability, and trust. It would probably do very well now. It wouldn't draw you the picture, though. but it would get you very close to what needs to be in the picture. How it needs to look what kind of font should you use... so for that I think it would do very well. I would recommend for others. It takes a bit of messing around, but that's one of those cases where, if you can't think of it yourself. If you're kind of creative blocked then it can help you a lot. But again you need to know what to ask you. What symbols do I use? What colors do I use? What fonts do I use. What should be the name of it? If you put those 4 together you could get a pretty good picture. What the logo should look like. You could even ask it. Hey, give me a prompt for DALL-E to make this happen. But then DALL-E would fail. I can tell you that because it's not very good in logos. Okay. So does that answer your first question?

Riccardo Murciano: Yes, definitely, moving on to the next question, think of you, how you use it, and how you use the tool of keeping the chat in mind. Conversation history.

id_6: I would say, it's actually not good at not very good at that because when I, when you say, for example, if you gave it the tasks, give me 5 names for for this dating app. It gives you 5 names and then you say, oh, I need them to be more fun and shorter and it would give you more fun and shorter versions. It does very well, and then you tell it. Give me 5 more examples, and suddenly it's gonna start forgetting the old stuff starts to forget it should be short. It starts to forget it should be fun. Starts, maybe even forget that it's about a dating app and like 6 7 8 messages down, even if they're not that long. I've seen it start to really lose track of what we're talking about.

Riccardo: Have you tried doing this also with GPT-4?

id_6: No, GPT-4 is super slow, I can not.

id_6: I can mostly speak about GPT 3.5. That's when I have extensive experience with okay. But yeah, I mean, yeah, yeah, chat you. GPT-4 is, as far as I know it's better on almost all axes except for speed, and that's the killer for me, because usually I want answers, quick.

Riccardo Murciano: Yeah. Now, with the web web browsing function, it's even slower.

id_6: Well, I mean, it's a weird thing to complain about. Right, hey? My! I took takes 10 s science for me. It's a very kind of modern day complaint, but sometimes it is. It is annoying, especially when I'm writing. But yeah, in terms of remembering conversation. History. GPT 3.5 is not that great?

Riccardo Murciano: It's not the it's not really used this function in specific? It's not something that you you take from like you use it just as ping pong.

id_6: You mean the function of remembering previous interactions?

Riccardo Murciano: Yes, precisely.

id_6: No, not really. I have. So I've I've programmed the a couple of apps now with the chatGPT for example, for a help center. So then it could answer help centrally related questions. And then giving it context. But this is

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system context. This is not like a conversation history, since the system context, meaning it's like the prompt before the conversation begins. That is, not from the user but from the system. For example, you need to tell it. Hey? There there are these help articles help central articles available. And then in the conversation it's able to reference to those articles. It does that pretty well, and that's a use of conversation history. Well. it's not your previous interactions per se, but it is the ability to understand the context, and to use the context through information, it does very well. I've had cases where I feed entire Csv files in the context, and then I let the users ask questions about them. That also works really well. I've had cases in courtly.com. We use it so it so I give it the information who you're talking to. So you start. So a user comes in, starts talking to chatGPT and I already prompted, and I tell it, hey? The user's name is John, the user's from Texas. The user has been, now, you know, active for 2 weeks. Users emails this and that. So then, when I ask it. Hey, what's my name? It's gonna say your name's John and I mean I haven't played around with it too much. But I presume if I said it, hey, give me a greeting or something is gonna say Hello, John, and so on, because it knows that context. But that's not exactly the information from previous interactions. It's rather the contextual information that you feed it beforehand. and that's not something that you usually do with chatGPT Unless you're developing into a programming or programming within.

Riccardo Murciano: All right. Perfect? This perfectly answers the scenario. Now heading for scenario 3, you can read it.

id 6: You are a customer support specialist at a tech company that provides software solutions for small businesses. Your role involves assisting clients with troubleshooting issues, answering inquiries, and providing guidance on how to use the software effectively. To help you manage the high volume of support requests and provide real-time assistance to clients, your company has implemented ChatGPT Plus with its rapid response feature. The goal is to enhance the quality of support you provide while reducing response time. How might ChatGPT Plus affect your ability to provide real-time support and feedback to clients compared to your previous workflow? Well. it's going to basically give answers to you. In fact, I would catch you out and I would just send the questions straight to the user and the answers to. So the question straight to chatGPT: and the answer straight to the user. We have done this in some projects already. It works very well. unless, of course, the user starts asking ridiculous questions, but then it's a ridiculous, jokes on it. So I would say, you know it pretty much replaces your workflow because it knows the help center better than you. It's answers faster than you. And there's very few cases when it's gonna perform worse, especially if you have the time to troubleshoot. You know there's cases where the user. I mean, even if the user comes in and starts speaking German chatGPT does German pretty well.

Riccardo Murciano: But maybe, instead of instead of seeing as such a me as a replacement of what you're doing, more as a as a tool that you can use to fulfill your job. So in this case the real time support and feedback to clients. So it's more like how chatGPT affects your creative output towards your client working with the with the team in comparison.

id 6: Let's say. I don't think the industry matters here. Let's say it's a it's a help desk for an airline at the airport. So it needs to be a person there, so no chance cutting out the person fine. So in that case it's super useful because you can punch in the question, chatGPT gives the rough answer.

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If it's coded correctly, it even gives references where it got the information from. So it I would say 99% of cases it would give you a straightforward answer. If it doesn't, you can ask clarifying questions, leading questions to get to to give the right answer. In my opinion, in most cases it's it's gonna do your job for you. There's it's all for the support roles. It does extremely well, if it's well documented, of course, and if it's quite standardized questions. Now, if if people come in asking different questions every day, and there's no help center. Nothing like that. Then chatGPT will be quite useless, and but that mean also means it's not going to be very well, very helpful to you if it's not able to understand what's going on. So it's kind of a mixed answer, I suppose.

Riccardo Murciano: Let's imagine the the questions that are being asked by the customers are not really that straightforward that chatGPT can just spit out the the solution. It's sometimes also involving with the personal troubleshooting issues where maybe you need to access personal data of customer.

id_6: Oh, very good point.

Riccardo Murciano: Just to finish: I want you to reflect on how you would use it, and what aspect of this usage. I mentioned here, for instance, a a feedback that you can ask. Let's say: I want you to comment on this way that I would solve this problem for this customer. And then you're seeing a feedback, for instance.

id_6: Yeah, so it's a it's actually a good point, for example, a Microsoft Azure: Usually you need to do something, There's the guide way to do it, and doesn't work. There's some error or something, because your particular configuration of of the assets is such that this and that is not possible, or there's some conflict that isn't to in the normal documentation. in which case the Support staff usually need to ask clarifying questions about exactly how you set up your stuff but that's where they usually also fall apart, not able or not able to help you, cause they mostly go by the standard case, and they I've a lot of times big companies like azure, They even have what's called unsupported scenarios. So if you're off to grid in terms of what our what is our workflow? Good luck to you! We can't help you, and we, in fact, we don't want to try and help you, because if you if something messes up, then we're reliable for giving the right wrong advice or leaking you down the wrong road. But of course there are cases where I mean you need to come in, and then i'll fix the guy's car or something, or he needs to come to the service and and get the car fixed. But, in short, how does it affect your ability to provide real time support? I think it gives you a lot more context. It gives you a lot more feedback in terms of what a good answer would look like. What are the relevant resources to look at. If we think about something like a small business software. I mean, software mostly is complicated, even if it's for small businesses when they have some specialized setup. It would also tell you chatGPT can tell you what questions. What follow up questions you should ask the customer. Hey? Is your is your setup in the German server and the Us. Server? Do you have a virtual machine, or a, or a virtual private server? You know, some questions that I mean they highly dependent on the context, obviously. But some questions which, especially for a new B. It might be, it might be completely unknowable what to ask. but chatGPT with enough training. We already know. What are the questions deleting on questions, and as you give it more context, it's gonna be able to guide you down the right path. And once you figure out what the problem is or the if you find the error message specifically, that is causing the issue. Then you

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were able to prompt to that error message, and then usually it knows very well what to do. So, in short, it would. It would amplify your ability greatly to be able to provide real time support

Riccardo Murciano: Awesome. Lastly, and it's gonna be a little bit of a longer discussion. Compare your work. So in case of collaborating with a human colleague to collaborating with chatGPT and how efficiency would be affected in both cases.

id_6: Yeah, so that's a great question. Actually.

Riccardo Murciano: So to further develop on this one: you previously had a colleague.

id_6: So you have some tech tech guy and you send an email to the tech guy and then 3 days later, you get a response with the clarifying question. And then 2 days later, you get a response, saying, oh, hey, this doesn't make any sense. You need to come down to my office. It would be way slower. It will be much, much slower, and it would. It would also, if you have 10 support staff and one engineer, which I think usually that's the kind of ratio you get. Then those engineers would get overwhelmed extremely quickly. In fact, in Microsoft Azure. For example, you can very rarely get to anybody who has any actual coding experience. You're mostly dealing with people are specializing in support, meaning they don't actually make anything themselves. They don't know how it works exactly. They just know the study of how to use it, and how to provide support. So in that sense you could have an actual kind of kind of an actual engineer to talk to all the time versus now you you very rarely have the opportunity to even ask questions to those guys. I mean, this is a... It highly depends on how chatGPT Is trained, though, because what I'm assuming now is the best case scenario provided that you you can.

Riccardo: You can also consider the worst case scenario. So worst case scenario. If it's the chatGPT out of the box, like the one you go on Open AI, a chat.open AI, and talk to. You will know nothing about your business. and therefore it would also know nothing about how to configure it. Unless you're using some wordpress, or something which is like a familiar framework, but even then you have to give it the context. They actually were using wordpress websites. Now answer the question of blah blah blah, because otherwise it would say, hey, i'm a conversational AI developed by open AI, and I don't know anything about anything which that is the worst case scenario, and that's that would be killer actually, because then it wouldn't know anything. But it's relatively trivial, and i'm sure with the plugins. It's gonna be very easy to connect your Zendesk help Center, for example, or your documentation and at that point it becomes very, very good.

Riccardo: Maybe, instead of maybe comparing it to the ability of chatGPT to fulfill your task, maybe think a little bit more about the originality and the creativity of your solution, and how it changes with the aid of AI compared to with a human. Maybe instead of a a tech guy, it's a closer employee of yours like it's actually a colleague that you collaborate with, let's say 3 to 5 h a day.

id_6: I mean, if you're talking about troubleshooting for software there's not a lot of creativity involved. In fact, when you start to be creative, you start to get you start to increase your liability for malpractice, in a sense, because usually there is a kind of a pre-approved solution to a lot

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of problems or a pre-approved answer. In a sense that I mean, for example, a zoom or Microsoft Azure. They're very careful not to ask you to do anything on production machines. You first make a copy of the production machine, and then you mess around with that. The reason being so, you don't do something irreversible on an actual machine. Because if you do, then there's no way back a lot of times where it's very complicated to get back, and nobody wants to be liable for that. So I'm not sure. I mean, there's some creativity, but it's not in sense of the designing Logos. We have to think outside the box. If you're thinking outside the box.

Riccardo: Well, maybe more on providing guidance, you maybe have to deal with a 75 year old grandma and...

id_6: Yeah, you need to adjust your tone, you need to adjust how you're doing explanations, you can do "Explain this to a 5 year old" kind of thing. Yeah, i'm, sure chatGPT would be. Actually, that's a good point chatGPT Would be very good at that because a lot of support engineers and support guys. They're you know. They're frustrated. They're tired. They've been dealing same thing 5 times, and on this on same day they've tired of explaining the same thing over and over. Versus chatGPT Doesn't get tired. It doesn't get tired of explaining the same thing over and over and it's not going to scream at you if you call it twice right so i'm not sure if that's creativity per se. But the customer experience would be, I think, a lot better by taking the best from chatGPT, and the best from a human kind of human support agent.

Riccardo Murciano: Okay? And if you had to decide?

id_6: which one to take?

Riccardo Murciano: Yes.

id_6: I think a well trained chatGPT agent is mostly going to do a lot better. In fact, for Microsoft Azure specifically chatGPT does pretty well already, because it knows all the azure guidelines and all the azure guides, you know, help central articles, and I can assure you Microsoft, an employee whatsoever. None of them will possibly know all of the your articles, because there's just too many.

Riccardo Murciano: Instead of thinking about the amount of knowledge that it's able to give you. Maybe the quality of creative input If you were to compare that.

id_6: I mean, your talk. Here's the problem you're saying is your car mechanic creative enough? You don't want your car mechanic to be really creative. Okay, You know what i'm saying. If in another case you'll be different. I don't know if it's well, i'm i'm not sure. Now what the good example would be. But if it's somebody designing your website right? And they come up with these all these cool ideas, you know nobody has done this ever before. And you like, oh, yeah, that cool. I want down my website so. No, you know, nobody's seen this before. for those kind of jobs chatGPT wouldn't be all that good, because it mostly can only synthesize what it's seen before versus a really kind of creative guy. He how he usually can come up, come up with something pretty cool in terms of surprising, you know.

Riccardo Murciano: Okay. So you would say that as a creative enhancer, a human will still be better.

id_6: Yes, in the context of building websites or making Logos or something. Yes. But in terms of customer support for a small business software solution it's equal to more to a car mechanic, where you don't want to be all that creative

Riccardo Murciano: I see all right perfect. This, concludes the the scenarios.

ID_7

Riccardo Murciano: So yeah, first scenario, I mean, these scenarios are kind of specific. But if you feel like sharing some experience that resemble to something that you experienced that was similar, just go ahead and talk about it, connecting it to your experience. It doesn't have to be too tailored to the scenario specific. But you still use your imagination and try to like. Think what you would do when you if you were in that position. vSo the first one I will gonna. I'm gonna read it out for you. "You are collaborating with a multidisciplinary team on a complex challenge: creating an innovative product line for a company specializing in consumer electronics. The project demands expertise in industrial design, product development, software engineering, and marketing. Despite the diverse skill set, the team encounters a creative roadblock and may lack the cross-disciplinary knowledge required for successful product development. To overcome this obstacle, the team decides to incorporate ChatGPT as a supplementary resource." So first of all, I want you to reflect on how engaging with chatGPT might have affected the team's ability to connect seemingly unrelated concepts or disciplines in the development of the product line. I but also just how it affected that in general. you can start by deducting from there.

id_7: Yeah, yeah, no. Here's the thing. One thing that I really like about chatGPT when there is a team working on a on a project. is that It's kind of like Everyone has a lot of opinions right when it comes to product development, and so on.. but sometimes having this mediator in the meeting, where you know, we Sometimes we actually pull up chatGPT, and we're like, okay, let's us chatGPT: You know. What are the consequences of doing this and boom. You got Bullet Points. Oh, actually, you got a big text. And then we're like, okay, chatGPT: Make it like in a super concise Bullet Point list of the top 3 most important thing about this thing right? And so, by bringing into the conversation chatGPT it allow us to kind of validate, or prove that Those are valid points, you know. That they should not be skipped. you know, should not be left out. So so that was our engagement with with chatGPT. And myself. I have sent screenshot over email, because sometimes you cannot have a meeting. But you're like, Look at chatGPT, you know. Here's the issue. Here's the thing slamming on their face. And and this is important because product development. It's like you said, it's design. It's software engineering, and it's marketing, right?

id_7: yeah, that's basically my 2 cents on the first question.

Riccardo Murciano: Okay, And How has the interaction with ChatGPT encouraged the team to consider alternative perspectives or viewpoints that might not have been considered otherwise?

id_7: Yeah, I mean, like that's the fact. I think that it is very important if someone knows what to ask you know. because if you don't have the person that knows what to ask, just Gpt is just not gonna really help you out with everything, though I believe that the interaction is important. But you also

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have to have someone that is that mentality to ask the right question, you know. So if you have a product owner, you have a marketing manager, you have a software engineer. Everyone can ask whatever they believe it's important. And then they share that with the rest of the team.

Riccardo Murciano: And if you were to develop a little bit further on the actual capability of chatGPT in this scenario that I presented to you. So you said it's to structure and the the main points of the a part of the development steps, maybe, or to summarize them. But if you were to think about how to come up with a solution to the creative roadblock instead. So, finding a new way around to get to this new development, how how would you think that chatGPT can can be helpful or not?

id_7: So at the end of the day. I believe that is a box full of information. but it's not allowing me to talk with my end user and my end customer of whatever product that I'm building. Right? So imagine we're building a a new consumer electronic device, right? like, you could not ask chatGPT: build the next, you know, big thing in music, and he would have come out with the ipod. You know what I mean, Like they could think of a think of like Steve Jobs building, the the famous ipod, you know. 3,000 song in your pocket. Easy to use, and things like that right? You have to be talking to people from talking to see action and following the habits, knowing what the environment is. So to me, AI and chatGPT need to embed a way to have information on the market, you know, like, hey? If I do this, then what would it be? The reception, the perception of of the market is it is? Will they like it? Will they buy it? How likely is that they're gonna spend money on this product? How likely is that they go to market for this product will be great, you know, because at the end of the day you can build the best product in the world, and it's just gonna go down the toilet if you don't know how to sell it or put it on the market.

Riccardo Murciano: You did a nice example with Steve Jobs. If you were still jobs in this moment, and you're about to develop the the ipod. How would you for this process and specific, use chatGPT?

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id_7: I mean, I think that it would have to try to... At the end of the day. It's validation, so I always use a chatGPT To validate things right. Is it best to do like one button versus 5 bottom? Is it best to do. You know the screen with the blue background versus the green background? You know what I mean. I think that should be that things that you have creativity, you want to fail fast, and you've unfortunately got to put a product on the market to fail, and then realize that you should have done the screen a different caller when chatGPT could actually have this information and help you on the product development to make the right choice, you know. Obviously it might not be as disruptive as people might think, because it's like a common creativity. But it could maybe help you playing safe.

Riccardo Murciano:So yeah, you use it mainly for validate in this scenario. And yeah, that we can go on the on the third question which more goes in the direction of ideation. So how do you think that the ideation process would that evolve if if this team implemented the chat iteratively for future projects.

id_7: I mean. definitely like ideation process. Yeah, ideation. To me, the ideation of any product should be done very close to the end user right, with

people that are gonna be and using it. And so for this reason it's a consumer, electronic or like. Let's say, you know, in this example. So to me, doing it we chatGPT it is actually like a a very bad decision. I think that it shouldn't be done with chatGPT. Unless we have, like a "consumer Gpt". Or like a very specific engine in this in this scenario

Riccardo: I see, but in this scenario chatGPT is not taking over the job of the team. Is it's just gonna be so supplement, supplemented Resource? Exactly. Exactly.

id_7: Yeah, definitely. Looking at statistic and definitely looking at the possible idea, definitely like getting ideas is probably one of the hardest thing to do like. And you know, since we're talking about creativity, you know, chatGPT, or any generative AI could come up with ideas right? So why not listening to what are other ideas to then make your own? But again. I have not used chatGPT to help me on ideation of of a product or anything similar like brainstorming.

id_7: yeah brainstorming. Yes, to get bullet point to get like, you know. Tell me 5 features that create stickiness when you know, like something like that. And definitely like to get support on the process, but unfortunately like in my case, all of the idea comes from our team and because I guess we are on on this world where we're not used to ask an AI to give us idea.

id_7: For us at that Gpt. Is it like a team member. So there's Mario there's Steve, etc.

Riccardo: There's gonna be a there's gonna be a scenario that goes more in this direction. So keep the thought for later. I think we covered everything for this one. Yeah, we can go to scenario number 2, and this one you are a creative designer and you're given a task of designing a new logo for a company's upcoming service launch. You're recently discovered that chatGPT provides you with a context based the response, and could retain information of your previous interactions as well, which you believe will help you streamline the workflow. Your main priority is to address all the requirements provided. but you find the challenging to keep track of everything without losing focus on the creative process. So in this scenario, how do you think, and what ways chatGPT could have affected your tasks to better address the clients requirements while still maintaining focus on your creative process. If you have questions, let me know.

id_7: Yeah, I do have a question. So i'm a creative designer. And I do follow creativity for many different clients, let's say, and because chatGPT keeps track my brain basically what I do. It kind of like creates like a DNA of my creativity. And then anytime I look for creativity or creativity help, it always gives me back my beliefs, you know I so I have I right there I will have a... I'm like, you know, when I actually do creativity. I have to wear so many different hats, let's say, and i'm not a creative guy. By the way, hold on, let's put it this way out there. But i'm thinking if i'm a creative, a designer. I need to, you know, put myself in the shoes of other, and create the best job for their situation or create, do some creation that are related to them. So if I have a Rock Rock Star client is different from you know someone that is an art designer, or a movie maker, or like whatever you know, whatever the the job is, you have to jump so far away that have in charge of it, actually have chatGPT track your style and try to repurpose it to you is actually counter productive to me. This should be a reset. You know what I

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mean. There should be like, okay, let do that track or reboot. Give me star blank.

Riccardo Murciano: I mean, if you If you open a new chat, you can do that right?

id_7: Right? Right? Yes. But are we sure that it doesn't track like, for instance, give you an example. We sure that it's really not tracking between chats. I don't know, like, let's say that you're not an expert user and and they change the policy down the line, and and they could do that.

Riccardo Murciano: Of course, of course. I mean to some extent, maybe it is, if they keep the data, because there's some information about them keeping the data that you fed him for their own training. So at some point it will get influenced anyways, which the reason why you're not supposed to share confidential and personal or third-party information. But in this case you you're using it as a tool to then make sure that you're still maintaining the requirements. So yes, it keeps track of your creative taste your creative workflow. But you in this case this capability aims at. Yeah, keeping track of the requirements. So let's say you have a a chat and you dumped down all the requirements that the client has sent you, and whatever format and then you use it for aiding your creative workflow. In that sense. Is it the scenario? Does it make sense now?

id_7: Sure, Like: yeah, Absolutely. So you're talking about: So i'm a designer. I receive a requirement, with all everything that I need to produce for this job, let's say and in terms of logo or design, or things like that, and all the restrictions, limitations, all that... I mean anything that help me be, let's say, compliant with the whatever that i'm doing. Bring it on, you know, having an extra brain side by side. It's like a super helpful avoid mistake, you know. Save me time and yeah, I would definitely use it for that purpose, for sure. It becomes more of like a smart personal assistant. Because this is what i'm thinking it's not a checklist. It's actually going in very fine things for me, which is a lot smarter, you know, based on that checklist. It it has the smart capability of actually checking, you know not only if I made the logo, with the right size, but like it, it has the concept built in, you know. So if the requirement set. You know, we really want to see, you know, a a background of mountains, because, you know, we're a a ski resort, and we want to have 3 mountains and stuff, and so AI can actually go and check those things. Maybe in a way, and propose alternatives as i'm going through the process. So I see it as a as a very good smart assistant.

Riccardo Murciano: So the field that it this assistant will help you in would be? what capability?

id_7: Two things! Two capabilities chatGPT helps me with. I stay on track with the project. but also on the on the creative creative part. to verify that i'm doing. You know that i'm on track, but also maybe give me some ideas, you know. Because again, if i'm on the right track, I don't mind AI, give me some alternative ideas to see if I missed something, and I could use some better ideas. And you know again, I am not a creative guy, so I will rather have AI proposed that to me, because I don't feel like i'm good enough on creativity when it comes to design, so I would definitely trust a little bit more of the AI. But again. There's some designers there that are like No, it's only going to be my idea, and that's it. But I know i'm. Not that.

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I know I have to put the as a creative design, and maybe I have to imagine to be. But since I am not, I have a hard time.

Riccardo: That's good enough. Could you think about whether you use this feature of chat with you, of having this conversational aspect that it keeps in mind what you prompted before. Have you ever used it? And for what purposes?

id_7: No, I've never used it.

Riccardo Murciano: Okay Yeah.

id_7: One thing that I would say so from a creativity standpoint. You know, we waste a lot of time doing non-creative things that are necessary. I give you an example. Let me give you some some of my problem, right? I have my hat on. I have my logo. I got my background, and I'm like, okay. Now, what I need to go Social boom. I gotta post all of this on my twitter, on my Instagram on Facebook, and and there's a whole bunch of requirements that are necessary. and one thing that I do myself. It's like I need to cut every images for the right size, for Facebook is this big twitter is a different size. It's a pain in the neck, so it's not really a creative things. It's more like a as a tool. But i'll be loved to, you know. Drop in all my stuff to chatGPT and be like. Give me everything the right format, everything, the right things, so that you know it's gonna be like that.

Riccardo: It's gonna be like that with the new update.

id_7: Yeah. So it's like the creative part is done. You, you buying me time to be more creative, and you do the task that I don't want to. Do. You know what I mean like? But they are today. Those tasks are. Consider under the creative team, you know, because they're the one responsible of providing these things.

Riccardo Murciano: I mean the the point of my this is to depict, then what what processes are the ones that will be less replaced right, and will be less taken over, which are. as you said: the ideation part in this case, and making sure that you still keep all requirements while still adhering to your creative process. We can go over to the next scenario. So in this case you are a customer support specialist at the tech company that provides software solution for small businesses. Your role here involves assisting clients with troubleshooting issues, answering inquiries and providing guidance on how to use the software effectively. To help you manage the high volume of support requests and provide real time assistance to your company has implemented the chatGPT plus with its rapid response feature. The goal is to enhance the quality of the support you provide while reducing response Time. In this case, with this, with this feature in mind, and with the type of work that is support special you as a support. You have access to this chatGPT. How would you? How would that affect your ability to do your job in providing real time Supportive feedback to client?

id_7: I can be very clear on this, because I do have expertise on this part. I believe that chatGPT in this case will be like a tremendous help, like an incredible help for scaling any customer support specialist and to have the ability to reduce the time response, the time to resolution, the proper finding the proper cause of an issue as quick as possible, so that it can get resolved. This is where AI can really help. And this is where we should look at AI as one of our best friends in terms of a technology. because I mean, we all went. We all had to call the big company because we have issue

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right? Is it Fedex? Is it UPS, you know? Is it like your school? Is it like we all have to get assistance right, even from like at the airline, you know. Flight is cancelled, boom, what do you do like? And and I mean people don't have time. They don't want to be on the phone for an hour. everybody knows how to chat right. Everybody knows how to write a message and and so on. So this is where AI comes in with a super powerful brain. It has all of the connected cases potentially that people can add. So how my chatGPT plus improve your ability to provide a real-time support and feedback to plan compared to your previous workflow? I mean like this is the Holy Grail to me

Riccardo Murciano: And what aspect would then be the one that is being improved the most?

id_7: So like I mentioned time to first response, that's super important, because the customer, when they need help, they don't want to wait. They don't want to be like 60 min trying to wait to speak to somebody to solve. Number 2 time to resolution. because even if you speak to somebody that doesn't mean that you get your thing solved right? That is just that you going into a chain of a customer support, but that doesn't mean it gets actually solved. So AI will certainly help finding root cause and find solution quicker. So these are the 2 most important.

Riccardo Murciano: Okay. So the speed of the AI to then get it. Get it done.

id_7: Speed, yeah, speed to resolution. Happy customer.

Riccardo Murciano: If you were to think about the interaction with it, would it? Would there be any other aspect. I mean, we we agree on speed. Is there any anything else when it comes to like? Because in this case we have a conversational chat with chatGPT AI. So how would that conversational aspect help the feedback and support loop process?

id_7: Let me tell you something, for sure. as we're moving to a global world, you know, one thing that I realized now is that people live everywhere now, right? They speak all different languages, all different dialect, all different things. And so the ability for me to like properly speak, let's say in Italian to a AI machine, and have the machine interpret that in English, so they can go and look for resources and help and then come back to me again in Italian, or you know that's like super powerful. and the same thing can be for people to speak Spanish or Chinese. You know you you find yourself like in in America and try to call a toll free number. If you don't speak English or Spanish, you can get anything resolved right, but we chatGPT. You're in a hotel, let's say in Alabama. You know, my mom. She only speaks Italian, she's like, okay, let me pull up the support. Let me ask a question and boom. She gets an answer right? So it it removes the friction barriers.

Riccardo Murciano: all right. Yeah, that's that's good enough. That's good enough, cool.

Riccardo Murciano: And maybe now it it. It it connects to what you mentioned before about having chatGPT as another team member. So I want you to reflect in how you would compare your workflow in this case to a collaboration, or collusion with a a human colleague instead. How will the efficiency of affected in such a case? So imagine now as a tech support specialist, instead of having chatGPT that helps you out with giving assistance to the clients you have a human, so it's it's still colleague you've been working with.

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id_7: Yeah. Well, They should be doing the things that chatGPT Don't do.

Riccardo Murciano: And and actually, how what capabilities would then be performed better compared to a human? What advantage is coming if you were to yeah, just compare them... side to side.

id_7: This is a good question, like in terms of support and and customer specialist of like collaboration to help. Yeah to to help out other clients.

id_7: Yeah. Obviously... I'm debating if AI will actually be effective in a way that are, You know that people will like to interact with AI, so that hasn't been, you know it's lightly improved now...

Riccardo: In this case the clients are not interacting with AI, and they in this case the clients are interacting with you, the specialist who is using the AI

id_7: Oh, okay, sure. Oh, yeah, I mean breaking into an open door. Everyone should have, like a AI on the background as their help, because just to give you an example: anyone working in customer support or specialists and things like that. We have a gazillion number of pages and information, you know, like, Think you work for a big company? And people put in like the Intranet, the Wiki Internal Wikipedia, the Knowledge Center, they you want to call it. And then the problem is, how can you quickly get the information that you need right now? And having chatGPT plugged in to help you get gather a response that's super important. I mean, we should have a a IntranetGPT. You know, like a knowledge-Gpt for IntrAnet for in inside the company, with all of the information of the company, obviously not to be shared with anybody out there right for specialists can easily say, oh, look! I have this person. I'm having a human interaction with this person. She needs this. I need to solve it. Let me check there. Boom! I secpmd I got the article, and I got exactly what I need to tell, you know, like, and and learn quickly and read more. And definitely I should be a teammate that help us do our job better and quicker. Absolutely.

Riccardo: So if I if i'm correct, if you were to compare it, the AI would be better, quicker?

id_7: Oh, yeah. AI will be quicker and it will help us do a better. you know. and and maybe the result would be better than us searching. Now, I don't want to say the AI is better than the human, because there's still like the human cognitive factor needs to be counted in. If the AI gives you 3 possible solution, the human will probably pick the right one. But yeah, it's definitely gonna be a tool that allow us to do our job quicker faster. In fact, there are already support. Just so, you know there is a company, Zendesk. They already embed an AI and they charge for AI response. If they solve the problem of the user you pay a dollar, and if they don't, if the user says that they couldn't find that the article that was proposed was not the right thing that they were looking for. Then you don't pay. you know. So there's already support that uses AI based on you on the knowledge Center. They go. Learn everything from your knowledge Center. People ask questions through a chat BoT, and if they come back to you with the solution. And the users say, oh, this is exactly what I was looking for. You get charged, and if not, you don't.

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Riccardo Murciano: And so the cognitive capability would then be better for the human, but the speed of response and the resulting creative process quality would then be higher if you were to use chatGPT instead.

id_7: Yeah.

Riccardo Murciano: all right. Any other capabilities that come to your mind that are comparable in this case. Obviously, in this scenario between the 2?

id_7: No. To wrap it up: time for sure, then quality of the search, you know, like basically chatGPT can search through so much content in super fast versus like a person like having to go and read and like, try to find things. But then also like. Yeah. So the accuracy on potential resolutions...

Riccardo Murciano: And if you were to think about the availability of them.

id_7: Oh, yeah, I mean ChatGPT is always available. But I assume that you know I have a 24 7 team also working on support, you know.

Riccardo: No, no, no, no, no, no, it's just it's just one colleague with all the legal yeah, pride rules on it.

id_7: Oh ok never mind! I mean, like it's a human. It has limitations, you know, like we're comparing now machine to humans. So limitation on the at, you know, working hours and a number of cases that they can handle per day. You know all of these limitations on, I, you know, related to being human.

Riccardo Murciano: Yeah, I think that covers everything. I'm just thinking about maybe other discussions that we can have. Have you ever used ChatGPT to dig deeper in some way, or do something repetitive with it? Not as in: resolve a repetitive task but more like iteratively using it for something that repeats itself.

id_7: Yeah, definitely. when I say "validate". Also, there is a obviously a discovery phase, you know, like when you try to go down. And you know you validate ideas, Obviously, because you get things back from the machine, you know, like you. Then go and dig more. You know you want to double down and certain things. So you also do learning definitely like learning quick learning. You know, much quicker than going on Google potentially and then for repetitive things: I'm now implementing chatGPT with spreadsheet. I actually already connect in my spreadsheets with chatGPT API and we wanna do cold email template based on people's profiles. But I'm not sure. I'm gonna end up using chatGPT and Google Spreadsheet or I'm just gonna sign up for like a specific service that already uses chatGPT: so kind of like, build it on your own versus like, just use a solution for it. But I definitely want to use. I want to use AI across the border, you know, Like, me as a start-up. I have a start up like I don't have much manpower. So leveraging this tool is super important. It's important, of course, of course.

ID_8

Riccardo: So the first scenario is following: You're collaborating with a multidisciplinary team on a complex challenge, creating an innovative product line for a company specializing in consumer electronics. The project demands an expertise in industrial design, product development, software engineering

and marketing. Despite the diverse skill set, the team encounters a creative roadblock and may lack the cross-disciplinary knowledge required for successful product development. To overcome this obstacle, the team decides to incorporate ChatGPT, I mean, of course, as a supplementary resource. So first of all, how do you think engaging with ChatGPT affected the team's ability to connect seemingly unrelated concepts and disciplines in the development of the product line? So I'm not going to ask you too much in detail on solving or going in-depth into the problem itself, but if you can get the general idea, that's enough.

id_8: So the question is, which of the three or all of the three?

Riccardo: We can start with the first one.

id_8: I mean, generally, ChatGPT is a very powerful resource if people are aware of how to use it properly. And the situation here is a little bit abstract, but what you're trying to say basically is how can you bring different expertise together to offer maybe new ideas or help them think about a new space, help them overcome this obstacle where they have kind of been stuck on. And I think it depends on how they can use ChatGPT and how they are aware of using this tool to actually offer them new ways to think about this problem. So I think this is one of the spaces where these tools can be very powerful, unlocking creativity, helping with new ideas, helping you generate new ways to think about a problem. I'm not sure of the specifics of this scenario, but I believe it's something that maybe not now, but maybe in two or three years, maybe in a year, maybe in six months, as these tools are evolving, you will have an even more stronger opportunity to do that. Especially because also the creative mechanisms that we start using with these tools are evolving. Right now they're very conversational based and with some kind of image generation, some character generation. And as these things evolve and also tap into things that we'll have and use, you know, part of the, I don't know, if these guys use Creative Suite or cloud or if they use Adobe products, and then eventually will these things be baked up into these, helping them kind of think about things. Is this helpful to you?

Riccardo: Definitely, definitely. And how do you think this interaction has encouraged the team to consider, I mean, you already said alternative ideas, alternative perspectives, so that's already covered. And then how might the team's ideation process evolve or not evolve over time if they continue to use this kind of tool?

id_8: Well, I mean, it's kind of hard to say. If I think about a team at the moment, I think both the interaction and how you use it feels kind of clunky. Because right now it means, like, whatever these people have, whatever this team is using, they'll have to stop. They'll have to log into OpenAI, create chatGPT accounts. It's not collaborative. It's not really kind of a space-breaking thing, except if they have somebody who's a smart technologist and they can pull this out and build this into a platform or like build this into a tool and bake this into something that they're using. And then again, chatGPT 3.5 or what it is at the moment, or some early versions of GPT-4. I don't know if you can just feed images or ideas into itself. They will have to structure the thinking in a way that it's probably a little bit more text-based and then help them with some of these ideas. I think if they're smart, if this team is smart, they can start using chatGPT as a contributor in this sort of process. And I think this is where it becomes interesting. I don't think they should try to think about the ideas as equal or trying to get solutions, but more like, hey, we're stuck with this thing. We need whatever

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this obstacle is that we have. Maybe it's really about a brainstorm. Maybe it's about thinking about something differently. And you can tap into this to help you think about a process from a different point of view. I think this is where chatGPT could become relevant because it's not about just encouraging information, but helping you think more generatively.

Riccardo: Perfect. Precisely. All right. We can enter scenario number two. I think we covered this one. In this second scenario, we are going to be looking at you being a creative designer and you're tasked with designing a new logo for a company's upcoming service launch. You recently discovered that chatGPT could retain the context of your previous interactions, which you believe will help you streamline your workflow. Your main priority is to address all the requirements provided, but you find it challenging to keep track of everything without losing focus on the creative process. In what ways do you think then chatGPT helped you better address the client's requirements while still maintaining the focus on the creative process?

id_8: Well, I mean, this is a much more productivity based scenario. So again, my question here would be, if you're saying helped you streamline your workflow, keep track of everything that allows you. I'm not sure what you mean when you say keeping track of everything. Is it my email conversations? Is it all my previous iterations from the logo designs? Is it all the checkpoints and milestone meetings?

Riccardo: Yeah, I'm referring to these general requirements that you need to keep in mind all the way while still being, let's say, open minded and focused on the creative part of it.

id_8: I mean, there's a couple of options here. Ideally, you can give all this stuff to a general AI tool and say, hey, I don't remember what happened in the meeting before last, but my client mentioned something about X. Can you go back? And then it pulls it up and there's, you know, there's new interface models that structure the whole, you know, we're playing around with these and so are other people. If everything is not organized by timeline, but by topic areas or like different, you know, desktop spaces that you can organize these things. So one is chat, you could be good at organizing these things and then helping you understand what you were looking for. Or you can outsource this whole communication flow process that then means that you will have much more space to focus on the creative side. Or eventually you could have maybe the thing doing both, which means the AI tool automatically takes care of your meetings and your notes and your transcripts from those conversations and puts it into a project timeline so you know exactly what you need to do. But then it also helps you or breaks this down into your creative illustrator suite, whatever you're using, and tells you exactly what things that you need to be done to transform seconds as a tool.

Riccardo: Awesome. Perfect. And accordingly, how might the chat meetings capabilities have influenced the effectiveness of the decision making process for you?

id_8: Well, I mean, this is where this is where it gets kind of murky, right? When you're like, do you need, you know, do you always need humans to make decisions in terms of the creative process? If a tool starts giving input, does it actually help making better decisions? Will it take the human aspect of control away? Will it take the creativity away? And what is it that you actually kind of balance out between those spaces in your decision making and what is the thing that's most helpful? So I think that one is about

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effectiveness, but then you take away the offered effectiveness and efficiency by losing some of the creative probabilities. That's a hard one to answer because these things are like really experimental at the moment.

Riccardo: And since I'm still on this task, where do you think then in this scenario, in specific, the tool of chatGPT would then excel? Like what aspect of it would you say, all right, that's perfect for this scenario or it's the worst for this scenario? One capability that really stands out.

id_8: I mean, the way you're laying this out, I think what it sounds like is this creative designer is overwhelmed with the workflow. And ideally they want the tool to take away all the nuanced, silly, logistical meetings. Maybe there's no PM involved. Maybe they're, you know, they're just company by themselves. So taking away all of these kind of routine tasks, projects, timeline, facilitation and all that stuff. So they can focus on the creative aspect. That seems to be kind of the evident here. The question is if that's actually beneficial because then they open up and having the space to do the things that they actually want to do. Or if again, like in the scenario before, chatGPT can also be helped, you know, be a partner, then thinking about the kind of early ideas for the logo redesign.

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Sorry, it was the service, the service blueprinting that they're kind of doing, etc.

Riccardo: Then we can go on to the next one, the last one. In this scenario, you are a customer support specialist at the tech company that provides software solutions for small businesses. Your role involves assisting clients with troubleshooting issues, answering inquiries and providing guidance on how to use the software effectively. To help you manage the high volume of support requests and provide real time assistance to clients, your company has implemented chatGPT Plus with the rapid response feature. The goal is to enhance the quality of support you provide while reducing response time. First question is how might chatGPT Plus improve your ability to provide this real time support and feedback to clients compared to your previous workflow?

id_8: Here it sounds like the scenario is somebody is helping with support in a tech company. Often these are, you know, situations where I think people read scripts and people follow specific instructions. And they often, if there depends on the training and the knowledge they have, they have to kind of look up specific kind of points of what to do. So this is something where it is very text based. So chatGPT and these generative items, if you feed them sort of the right information and set them up in a way, it could be very helpful to provide that information in real time. So one is, you know, a different version of a chatbot as we have them now and they never work well. Two is maybe then helping the human support specialist who's there help finding the right information and enhancing the quality of the call or the quality of the feedback that they can give. And also, you know, as you say here, reducing the response time, especially if these tasks are delicate. But mostly they're somewhere pretty automated. So they follow kind of the script. So maybe chatGPT will be kind of an interesting kind of partner in that. But I'm not sure the use is as powerful and needed as maybe in some of the cases from before, which were more productivity and more creativity based.

Riccardo: Yeah, if we were to change the scenario into a more creativity based scenario where you use it to have a feedback loop in the sense that you... How would you think that the fast response, like the short response

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time of chatGPT could help you enhance your problem solving skill, like your creative problem solving skill in this regard?

id_8: Well, I mean, again, I'm not exactly sure what kind of information is needed. But if it's about software or something where it's technical, I think it also depends on sometimes chatGPT or these two can be a little slow and they can be very wordy and very text heavy. So I'm wondering if that will actually help in this context. But if I'm optimistic, I'd say, yeah, sure. It will go through a bunch of the data for this complex solution. Maybe it requires some code, maybe it requires some more kind of complex problem solving. And then I think it's more useful if it's something where people just look up a manual and that manual has... Normally they can embed it into a set of software tools. Maybe that's something that chatGPT is not as critical because it's a low complexity task.

Riccardo: And lastly, could you compare your workflow in this case with colluding with a human colleague instead? How would efficiency be affected in such case?

Riccardo: When you say, what do you mean with colluding? Colluding like working together. So, yeah.

id_8: So working with chatGPT versus working with a human?

Riccardo: Yes.

id_8: Well, I mean, my preference is normally, I prefer working with a human no matter what. I mean, if you depend, are you asking, I'm the person asking for customer support, a human versus chatGPT or is it the customer specialist asking for chatGPT help versus a colleague?

Riccardo: Yes, you are the customer support specialist.

id_8: Okay. I think it depends on how these jobs are kind of structured. And often when you're in these situations and people need help, they need to put you on hold and then they need to kind of get somebody that seems to often take time. So I'm not sure if they're stuck with the situation and then they could use chatGPT to help a problem that could add efficiency. I would in no circumstance say that if this is something that's automated, chatGPT can be helpful. I would not say take the human out of the equation because there's also factors like job satisfaction and happiness and kind of communication skills. chatGPT kind of takes out of the equation.

Riccardo: Yeah. And if you were to focus a little bit more on the comparison in terms of like your performance on finding out a good way to do your job as a support specialist, like working together with a human compared to working together with a conversation you're having with chatGPT.

id_8: Yeah. It's hard to say because I'm not a support specialist. I'm not fully familiar. I'm imagining a scenario where I'm a support specialist.

Riccardo: But you can also use your own experience. You can also use your own experience if you think that helps showing your perception of it.

id_8: I mean, in my mind, it definitely sounds more efficient to get chatGPT's help. As long as I hypothesize on a positive scenario that chatGPT works, is accessible as fast as all the information needed, it doesn't start

hallucinating about some random bubbly stuff. It means, yes, I will probably get the information. Is it the right tool for this? I don't know, because I find it is more generative and probably more helpful in creating new information, helping structure problems. And this is a problem where I need a very specific sort of information that I can probably find in another tool, maybe equally as fast.

Riccardo: OK, interesting. And on the creative aspect you just mentioned, how would it compare to having a human instead, like working together with a human?

id_8: I think the way that I see the scenarios, like where I see the strengths of these tools is working together with humans, but helping you also think about things you haven't thought about before. Helping you think about, you know, maybe reframing problems, maybe reframing how you want to write an essay, maybe reframing something new. I think the generative aspect is where these tools are particularly interesting. I think here it depends on how the tools and the software is kind of set up, so it's harder for me to judge.

Riccardo: OK, perfect. I mean, it's close to seven, so...

ID _ 9

Riccardo: So the first scenario, I can read it out for you if you want. So you're collaborating with a multidisciplinary team on a complex challenge, creating an innovative product line for a company specializing in consumer electronics. The project demands expertise in industrial design, product development, software engineering and marketing. Despite the diverse skill set, the team encounters a creative roadblock and may lack the cross-disciplinary knowledge required for successful product development. To overcome this obstacle, the team decides to incorporate ChatGPT as a supplementary resource. So before we go into the questions, how do you think engaging with ChatGPT affected the team's ability in general? And then we can tailor it more to question number one.

id_9: So before answering the questions, the baseline assumption is that they use ChatGPTin a helpful and productive manner, right?

Riccardo: Yeah, but it doesn't have to. You can also see it as something...

id_9: Okay, well, then there are always these two sides, right? If they understand how to use ChatGPT and are capable of formulating their questions and roadblocks in an effective manner, I think it will help them resolve it. Mostly because creativity, especially from the team, benefits from a couple of factors, right? I mean, the equality within the team, also the ability to freely formulate your thoughts, to have your train of thought not interrupted in a creative session, super important. And I think if ChatGPT is this kind of neutral supporter without stakes in the game, that when used properly can benefit a lot of these processes that human creativity kind of gets from. Depending on their knowledge with creativity, they can, for example, use a bit of a double diamond model, right? Our creative brain system can use a double diamond model, and I'm sure ChatGPT knows how to implement it. So basically, let's get wide with our ideas, let's narrow them down, get wide again and narrow it down for a final product. And I think these are frameworks that when prompted properly, that ChatGPT will be able to really guide them through this in an effective manner. Of course, if they don't know how to

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prompt ChatGPT, right? We talked about the importance of prompt engineering. And I mean, you also kind of need to know about the existence of these concepts in order to implement them. Then I can see this to be a bit less effective and fruitful.

Riccardo: Okay. And when it comes to their ability to then find a way to solve the problem with this specific scenario in particular, where do you think ChatGPT has the most impact? Like on what elements and what aspects of this?

id_9: You mean from the industrial design, product development, software engineering and marketing?

Riccardo: Yeah, from the problem they're encountering. So basically, creative roadblock that requires a cross-disciplinary expertise.

id_9: I think it will be able to combine different disciplines and topics that are relevant in different disciplines and kind of throw them together. I think it will be good at providing new input. I don't think it will be able to find a satisfactory solution. But I think that's where its strengths are. You can describe it and then ask it to show your parallels between different ideas or different relevant aspects. And then use it as an input to continue your creative soul-searching, if you want.

Riccardo: Can you maybe further develop on what you mean with new input?

id_9: Yeah, let's use an example. Like you have an industrial design slash product development. Let's say the creative roadblock is there. On one side, they have a very strict guideline of how the industrial design has to be made maybe akin to a certain requirement, certain model. Let's assume they know a bit about this but they're not too familiar with the intricate details of it. Then how can we let this flow into the product development? Let's say they have also a product idea but they're not sure of how to connect this with it as possible. Then you can basically say, this is the industrial design guidelines that we have. This is the product development idea that we have. How can we combine these two or how can we adapt the product development so that it fits to the industrial guidelines? I think these are problem-solving techniques that you can basically throw at chatGPT and then its answer will likely not be 100% because there are so many things you need to consider. But it will probably be like, oh, if you change this part of your product, it will be more akin to the industrial guidelines. Then basically, oh, okay, it removes parts of the roadblock and it shows you a way around and you can then continue on your path.

Riccardo: Okay, this is an interesting thought more for scenario number two. But I like it, okay, perfect. Going to question number two. How do you think this interaction with chatGPT encouraged the team to consider alternative perspectives or viewpoints that might not have been considered otherwise?

id_9: I think, again, two scenarios for the scenario. If it's being done in the team, then I think it will just kind of tap into the conversation. But I can also see that team dynamics will not give too much importance to it. On the other side, I can see that if people are in this creative process split up again and brainstorm for themselves or develop their ideas in their own context, that then interacting with chatGPT can also be very beneficial because then it really allows you to have a brainstorm session by yourself. But you're not by yourself. You have something that reflects your ideas in a

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way and I think that can be very helpful to work out your own standpoint, your own ideas and then come back and present them in a proper way to the team.

Riccardo: So if I were to summarize, it would be a new input, brainstorming capabilities and then sort of wrapping up capability in this regard, right?

id_9: Yeah, but also, I mean, creativity is such an interesting thing. In a creative process, it can be a challenge because here it really does not depend on your personality or how much you contribute to it. I'm a person who I like to talk in meetings as well. So as an extrovert, it's never difficult to kind of talk about your ideas. But I also noticed that when too many extroverts are in a team, that introverts, people often have genius ideas that are just being talked over. So I think chatGPT is this neutral part that doesn't care whether its ideas are being heard or not, that can kind of give room to any proposal. So I think using it in this context, right, using it as a facilitating tool for social team dynamics, it can be a very powerful combination.

Riccardo: Awesome. Perfect. Okay. o when it comes to creative process, how do you think then it affects it? Maybe because, exactly, I'll just ask the third question then. How do you think the team's ideation process would then evolve over time as they combine, as they continue to use chatGPT as a resource for these kind of things? If you were to portray it in the long term.

id_9: So the creative process is a skill you can kind of learn, at least designing the process. And I think integrating chatGPT into this process is also a skill you have to learn. So the team leader or people responsible for the process have to make a cognitive effort to integrate it. So if it's simple to integrate, if it's easy to understand, then you have a few ideas and theories of how behavior is being adapted by external factors, then I think it will benefit the team in the long run. But with any tool, just for the mere fact that it is a tool that is potentially helpful, it's a necessary but not a sufficient factor that determines whether the team will actually adapt it. So people will have to not feel threatened by it. People will have to enjoy the interaction, will have to see that it's useful. If these things are given, then I think the team has the capacity to integrate it more and more into the flow. Maybe through a specialized interface, maybe through a bit of guidelines. But I think it will help with the ideation process in general. Not just in creative product development, but also in a lot of parts where you need to circle through ideas and through the creative process.

Riccardo: Perfect. That's good for scenario number one. I'm just thinking if we covered everything. No, it's perfect. So scenario number two, it's going to be three in total. In this one, you are a creative designer and you're tasked with designing a new logo for a company's upcoming service launch. You recently discovered that chatGPT provides you with a context-based response and could retain information of your previous interactions, which you believe will help you streamline your workflow. Your main priority is to address all the requirements provided, but you find it challenging to keep track of everything without losing focus on your creative process. So in this case, in what ways do you think chatGPT affected the task while still addressing the client's requirements and maintaining focus on creative process? So we're more, let's say, in detail on the aspects of it, retaining the information, keeping the chat and knowing what you said previously.

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id_9: I mean, also here is a pre-requirement, right? It's chatGPT, at least the free version, it has a certain context. I think it's 2,054 tokens, maybe. With that, it can be a bit of a challenge to have very long conversations and it's still being able to accurately remember all of the information that you require. On the other side, GPT-4 or Claude 2, they now have context lengths of 30,000 or 50,000 tokens. So you could write a book and give it to the models. You can write a book about your, or the equivalent of a book, about your certain task of the requirements for designing the new logo. So I think this can be helpful, just as a caveat first, but then how this will affect your creative work process. And I think this echoes a little bit what I said, part of my answer to the third question of the first scenario. It depends how easy it is. What is your own perceived behavioral control? What is your own perceived skill in implementing this? With any technology, it can be useful, it can be amazing, but if you as an individual person feel like it's a chore, like it's not really nice for you, then it will probably negatively affect your creative process, because it will kind of limit you in your free expression. I think there are ways around this, but like I said before, it's a skill you have to learn. If it's difficult for you to keep all your documents together, if you don't work that way, sometimes you write something on your computer or sometimes on a post-it and put it on a wall at home, and it is faster in your mind, then it will be difficult to adapt your workflow and basically have a person you always need to talk to. It can also affect your own creative performance in a negative way.

Riccardo: If you don't have those skills of interaction.

id_9: Exactly. Or if your own self-perception in that context is one of, I can't control it, it's a chore for me to control.

Riccardo: Perfect. Have you ever been in such a situation where you had some requirements that maybe were a lot and you wanted to make sure that you're meeting them all, but you wanted to not inhibit yourself on the creative process, the creative flow, and you used this tool to keep track of what you're doing? Like a fact checker?

id_9: Yes and no. Sometimes you want to realize something, but there are too many loops you have to jump through to just play it safe or play it nice. There are too many things you need to learn. That I indeed find to be a barrier or something that doesn't make the work process nice, because you really have to focus in on the exact rules that are externally prescribed, and you have to understand them first in order to be able to come back to this free-flowing creative process. I think the literature is pretty clear on this, but also from my own experience, if you have to focus on the exact details, if this person, this creative designer would have to focus on the exact details, how to record everything based on very restrictive requirements by the client, then I would assume it would interfere with the creative process.

Riccardo: And in this scenario, chatGPT would not really have too much of a voice because you think it's better for him to not interact in this scenario?

id_9: No. If it's not already seen as a chore, maybe let's talk about also the learning process. The first week is getting kind of difficult, but by the second week, you kind of think, oh, this is how I can do this. You find your own pace with it. Then I think it can be helpful integrating it. The question is how flexible you are with your work process, and what are you

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willing to invest the time and energy by yourself to figure out how this interaction could work?

Riccardo: I see. In this case, I'm trying to understand how it can help you keep the context, right? That's the scenario that I would like to present, maybe to then shift it on your personal experience. Have you ever used it to have, for instance, the bigger picture on a topic or a work that you're doing?

id_9: Sure. I've used chatGPT, the conversations, to just walk out a thing, sometimes with a specific framework. One that I really like is the Socratic dialogue, where you just ask the questions. Like, oh, this I haven't considered, so how would you do this? Then after X back and forth, you were like, okay, now summarize the whole conversation for me so I can save it somewhere. And I find this extremely useful. Once I do already have the chats kind of saved, that's nice, but have it create a summary of your conversation so you can use this as a baseline for something else. I think it's super nice.

Riccardo: So you think it's accurate, it works well, and it can be very positive?

id_9: I think it's accurate, it works well, and it can be very positive. Especially with chatGPT 4, I'm using the paid version and that I find just again much better than the 3.5 freely available version. Personally, it benefited me a lot.

Riccardo: Awesome. So it helped you also maybe focus on your creative process?

id_9: I mean, especially at telling chatGPT to help your creative process, just giving this instruction is much better than just asking questions. Just help me with this and then it will really kind of try to tickle your approach, how you see these things. That's already money in the form of having to think about things you wouldn't think by yourself if you don't have an interaction with a person. Perfect. Okay. Good thoughts. I mean, we can skip question number two because we already covered it. Sign number three and the last one.

Riccardo: Here you also hear a little disclaimer. It's about the interaction with it, not how it does your job. You're a customer support specialist at a tech company that provides software solutions for small businesses. Your role here is to involve assisting clients with troubleshooting issues, answering inquiries and providing guidance on how to use the software effectively. To help you manage the high volume of support requests and provide real-time assistance to clients, your company has implemented chatGPT Plus with its rapid response feature.

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The goal here is to enhance the quality of support and reducing response time, right? So you're assisting software-based consulting issues that come from other companies and you have chatGPT Plus as an aid, as a collaborator. And how does this even impact your job in general, first of all?

id_9: Before I start a disclaimer, I'm working with a software implementation of something similar. So I'm, of course, convinced of this kind of solution. But basically, how you would do this is you would use chatGPT, but you would also use a digitalized vector database of all of your documents, right? And then what you could do is have a client come in like, oh, this doesn't work

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for me, or I have a question about this. Then chatGPT doesn't answer chatGPT, but it answers based on all of these documents, because then it knows the do And from what I know about this process is that it helps with a lot of customer client requests, right? I mean, a lot of interaction points with customer clients is like common questions. That's why you have an FAQ on many websites, right? The frequently asked questions, just things that always come back. And to use chats or GPT implementation for this, I think is making it much more pleasant for the users, but also for the customer support agents. Because 80% of questions can be answered by just having a short look. And for these remaining 20%, I think it's still nice to have a person in the loop to help them, right? Like, oh, I see you don't have this very specific question about how to integrate product A with product B, API doesn't really work out. So we really need somebody who has encountered this before. So I think, so to answer the first question, how might chatGPT Plus affect your ability to write, write and support?

Riccardo: Just before. Here, chatGPT is not really seen as something that does the job for you in the sense that it has access to all the data and it solves the problem of the customer. But more, it's how it interacts with you in providing the solution in the sense that you, how can I explain this? It's more about the...

id_9: Enhancing the abilities of customer support agents.

Riccardo: Yeah, and it's also like issues that are not really just black and white. You know, it's something also completely new sometimes that really needs some level of creativity to figure it out.

id_9: Yeah, right. That would be in these remaining 20% of the questions. And I mean, these first 80%, you can have a chat interface or for the customer or for the support client. So basically, you can have the customer find the answer themselves. So when they call, a customer support agent picks up the phone and asks, okay, how can I help you? They ask the questions, the customer support line enters the question into their own model and they get the answer back. And then you can also play around with how you get the answer. You can, this is the short answer, but maybe ask this as a follow up question. You can really, then you can play around with it much more and guides the conversation a bit more. And I think that can be a very liberating experience for the customer support agent because they can outsource part of the knowledge stack that they require for their work. So knowing what kind of version of the model or of a product goes with which kind of software. If you've done, if you answered the question 20 times, you might know it, but otherwise it's a bit of a training kind of thing to know, I find. And that's where A.I. models like chatGPT Plus come in amazingly nicely.

Riccardo: Awesome. And let's imagine now that the specialist has to answer or like come up with a solution to like a certain problem that is being shown, a troubleshooting issue. And maybe the first way that he proposes or she proposes the solution is not the right one. So maybe there has to be some peer review or another version of it. So in this kind of scenario, how do you think chatGPT can help or not help?

id_9: That's a good question. I think, right. I mean, of course, it's still the best way if you have a thinking competent person when you call customer support and they know kind of how to solve this. I mean, ideally, they wouldn't even really need it because the documentation is so easy. But for all the things and maybe also like before, for the first scenario, the GPT

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models, they can provide a very good starting point. I wouldn't read it and then say, oh, this is as an A.I. language model. But basically just take the input combined with your own knowledge and based on that, provide an answer. So it's basically, in a way, a very good, effective Google, right? It's a very good search engine now for your own documentation, for your own documents. But still, it's very helpful in taking away all the time that you might need to go through the documents and find the exact paragraph that is described. In that capacity, I think it's very helpful. But it's still only a tool, right? In that capacity, it can't always, it can also make mistakes. It can and it can fail in ways where people might still need to come in and check.

Riccardo: I see. So it can deliver some sort of feedback, but it's limited to its data set in that sense. And if you were to consider the generative aspect of it, because if you could also argue that it's able to create new data to some extent, right?

id_9: Absolutely. I mean, now we get into a field that's a bit more open to looking into the crystal ball, trying to predict the field. But there are very nice models out there already. One of them is called, for example, Smart GPT. It just does API calls to GPT-4 in the background. But if you ask it a question, it basically asks the same question five times to GPT and gets five slightly different answers each time. Then you have another GPT model that takes these five answers, looks at them and evaluates them. And basically these five answers gets like another answer, like a summary. So basically this model is like a researcher. Then it gives it to a final conversational GPT model that takes in conversation and then provides something. OK. And that's pretty cool.

Riccardo: It takes a little bit of time, maybe?

id_9: It takes a little bit of time, but you can basically have way more complex questions and problem statements. And you can have more thoughts that GPT-4 kind of executes in the background and then comes back to you. So I think in that sense, it can really produce new insights, basically an average out of different possibilities. And then it can come up with very creative, different ideas.

Riccardo: All right. And now maybe to the high point of this scenario, keep that thought in mind. Now, imagine you are collaborating with a colleague. You've been collaborating for some time already to solve these kind of problems with the customer support specialist department. How do you think it would compare to using chatGPT instead? Being with a human colleague and chatGPT. Let's find some aspects that you think are changed or differ, maybe better or worse.

id_9: It can't compare with a human colleague. It really can't. And I think you have a similar effect, already not using AI, but just people work from home a lot. I mean, I would split this up again, right? On one side with work effectiveness or work performance. It might even be better if one person that really knows how chatGPT is working, he or she might do the job of two people. I think that's something that we can realistically assume.

Riccardo: Yes.

id_9: However, for work satisfaction, for how much you feel related to your company, how you behave towards your company, how motivated you are to work

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with your company. I think these are all factors that are highly dependent on the social environment. And factors, psychologically speaking, we have to talk about things like organizational citizenship behavior, OCD. Which really comes or lives from how much you like the people around you at work. On the one side, of course, you have the job. The mission, the vision statement, but on the other side, how much do you play with the people? And if we replace all of this just with AI, then I think while you might be a bit more effective, I think the turnover rate might also be higher. In the sense that people are like, okay, I haven't gotten a promotion in a while, I'm rather going to go to a place where I earn a little bit less money, but where work is actually enjoyable.

Riccardo: Okay.

id_9: I have a talk about coffee, right? Just stupid ideas. I can talk about it to be sure I watch the last time.

Riccardo: Yeah, exactly. So, definitely the emotional aspect can be a creative enhancer in this case, and it can only be given by a human colleague, right? Maybe, then focusing more on the aspect of having a peer review cycle or just someone to, let's say, consult about a problem that you're solving about. Sort of a feedback looping. How does this in specific apply to the comparison, in your opinion?

id_9: I think, I mean, what I described before was a bit of this or statement, right? If you have an end situation where you have human colleagues and a chatGPT, there I think you're playing a different ball game in the sense of you have the social dimensions from human colleagues, but then you have chatGPT that can really enable you to understand the workflow better, to solve meaningless tasks more quickly and to reflect on creative ideas that you might have. And I think there it really adds a lot to the process, right? I think that there it can really support people and really be tailored to their own personal needs and to their own personality.

Riccardo: And which one would be then more efficient for this task in specific?

id_9: For just creativity or...

Riccardo: For the, let's say, tailoring more the creative solution you want to give to the customer. So having sort of a feedback, loops of feedback, peer reviewing, validating these kind of aspects, how these?

id_9: I think chatGPT and human interaction are strong different points in this pipeline. For example, in the beginning, I think human interaction can be very beneficial to get completely weird random input if you have such a team. And then down the line, I think you can use chatGPT to find your ideas or to get new input. So probably in the end, I think the chatGPT is probably more competent and more stable or performance stable creativity enhancer. So I think learning it with AI is definitely going to provide you more often a good outcome. With people, it depends on your team, right? What are the team dynamics? How comfortable are you with bringing up this potentially stupid idea?

Riccardo: But in the best scenario, you would think that there's more potential in the human team for this?

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id_9: Yeah, but it's a very, I think it's a high bar. I think a lot of teams will, even though they would like to achieve it, they probably don't.

Riccardo: Okay. I assume also time of interaction changes?

id_9: Yeah. You have to, I forgot the exact name of the effect, but the bad apple effect. You have a very high functioning team. You get one new colleague that's kind of a freeloader who doesn't pull their weight and then the whole team's performance drops.

Riccardo: Yeah, of course. I see.

id_9: So there are a lot of very free-flowing kind of processes that are very difficult to control. And if it goes wrong there, then okay, now, then also the team doesn't perform that well anymore. Then I think having chatGPT in this pipeline and to help people to maybe not have to have a meeting with six people anymore, but maybe three, right? Smaller teams spend more time on social action, but be more creative and effective.

Riccardo: Has it happened maybe to you that you felt, or you compared in your mind, chatGPT to a human colleague in the aspect of providing feedback? Maybe you don't even use chatGPT that often for this.

id_9: Yeah, yes and no. I mean, I'm using chatGPT for that, right, to give me feedback. Or to, right, today in the morning I use, oh, this is how I want to deploy my package, this is a smart idea. You're like, oh, well, you can do this. Oh, wow, I didn't even know that, right? Then my plan changes. I would say both because I'm a psychologist and because I work with AI, I wouldn't consider it as a colleague or as an entity capable of free will. Simply because I think I'm too familiar with the underlying architecture and how simple it actually is to consider it being something more than a tool. A super competent tool that might take over the world, but I still don't think it's...

Riccardo: It's just executing a task, right?

id_9: Yeah.

Riccardo: Okay, so if we had to wrap up with this scenario, how do you think then it compares to a human when it comes to collaborating with you? So we said the emotional aspect is incomparable, like it's a different level with the human. And how pleasant, how smooth the connection is with the human also changes your creative performance. But on the other side, we have more effectiveness and consistency with AI. If you want to further elaborate, maybe.

id_9: Yeah, I think the question is, are we now at a point where as humans, as companies, we can solve creativity, right? Solve in air quotes. Because I think, indeed, using ChatGPT to enhance your process is a skill you can learn. And I think that enables you to, in the long run, perform better and more creative. So I think it's definitely a skill that is helpful in the creative context to learn and to elaborate further. I mean, in the best context, right? In the best scenario, you would have a highly functioning team that's very harmonic, in which every person in the team knows how to use ChatGPT for their own speciality. And you use this as an enhancing method to enhance the creative potential that the people have. So I think in that way, it's really

an effective tool in the sense that it works as an amplifier of the potential that people already have. I think that would be my final answer.

Riccardo: Perfect. Maybe to just reflect on this final point, do you think that in case, in a worse scenario where people are not really able to use it, do you think there is a danger of it being an inhibitor of creativity and maybe having a negative output in the creative process in the long term for a team or for a singular user?

id_9: Yes, I think so as well. I mean, being able to use ChatTPT effectively, I would probably assume it depends also on your own ability to formulate abstract thought or to make long term plans or to be able to prescribe your ideas. And I can also see that people, either due to their innate inabilities or maybe they're handicapped in a certain way, maybe they are in a position where they're not doing well mentally, then I think this additional task of explaining yourself, explaining your thoughts in a cohesive manner can be detrimental to the work performance.

Riccardo: Okay, I see. Perfect. So it also has the other side of the blade.

id_9: But I mean, ideally, I think that holds for every tool, right?

Riccardo: Yeah, every technology, of course. That's interesting. Okay, perfect. Just thinking if we covered everything. Yeah, I think we did. So now number three. Yeah, that's it. Awesome. I mean, I think you know that every result, everything that we talked about will remain anonymous, also your identity. And yeah, I will then send you the results of my thesis on the system. It's going to be like mid-June.

ID_10

Riccardo: So imagine you are collaborating with a multidisciplinary team on a complex challenge, in this case, creating an innovative product line for a company specializing in consumer electronics. The project demands expertise in industrial design, product development, software engineering and marketing. Despite the diverse skillset, the team encounters a creative roadblock and may lack the cross disciplinary knowledge required for successful product development. To overcome this obstacle, the team decides to incorporate chatGPT as a supplementary resource. First of all, how do you think engaging with chatGPT affected the team's ability to connect seemingly unrelated concepts or disciplines in the development of the product line? Because as you can see, there is multiple expertise demanded. So how do you think this aspect of this creative roadblock solving is affected by the use of chatGPT? How do you think it can?

id_10: This is more on the positive side, right? Or is it both positive?

Riccardo: It can also be negative. I just want you to think about how you think it can influence.

id_10: Well, one thing that chatGPT is very good at is simplifying concepts, right? So the fact that, let's say different people have different backgrounds, but they may themselves not be able to explain it very easily to somebody else. So they could use the tool to simplify their communication. So just through prompts, like "explain this to a three-year-old" or "explain it in business terms" or "turn it into a wrap", whatever works, you know,

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you could use a fairly complex project, complex ideas and simplify them and communicate that better. So that could actually connect in multidisciplinary teams in a more seeming way. Yeah, I think that's what I would keep for now.

Riccardo: Okay. And how do you think the interaction with chatGPT encouraged or inhibited the team to consider alternative perspectives or viewpoints that might have not been considered otherwise?

id_10: So the thing with, okay, this is the second question, right?

Riccardo: Yes, yes, it is. Yeah.

id_10: Here I see both a pro and a con. So I have encountered, I was actually talking to a friend of mine who runs a similar, like he was in this exact situation and well, they run a glass producing factory and he was looking for ways to optimize it. And normally they do this in a large team, but then he was like, well, let me actually ask chatGPT what it could do. And it gave a lot of answers which were not known in, let's say he does this in Ukraine and with their technology and knowledge, they didn't know some of the things which are tried out in Sweden or tried out in US. So that opened up whole new frontier to them. And the fact that they could go in and ask further questions actually made it very interesting for their technical team to consider. So it opened up new frontiers for that. The challenge becomes when people blindly start following this and turn their own brain off. So when it's supplementary, that it makes sense, right? Say, oh, think of chatGPT as yet another team member instead of the director. And then you say, okay, well, hey, we have discussed this. chatGPT has suggested this. Let's take that into account. And can we argue against it and communicate with this extra smart person, but let's not make them the ultimate smart one because they also don't know the local context or they may give you the same advice as they will give your competitor. Therefore you will never get it to a competitive edge if you all use the same tools.

Riccardo: Yeah, no, I agree. It makes sense. And if you were to think about the ability to ideate, so how do you think the team's ideation process would evolve over time if chatGPT is continuously being used as a resource?

id_10: I think in the beginning it can be a source of competitive advantage and later it won't. Meaning that right now very few people are actively using it. So many people are aware of it and very few are actually using it in their business. Therefore, in the short term, there is an opportunity for competitive advantage using the extra brain you can use. But I compare chatGPT to the sixth finger. If everybody has a sixth finger over time, you don't notice that you have a sixth finger. So in the long term, I don't see just basic usage of prompts in chatGPT will lead to competitive advantage. It's the same thing as saying, now you have electricity and I have electricity. Is that my competitive advantage? No, it's not. Now, more broadly, if you look at the internet, yes. In 2000s, any company that just went digital, already that was its competitive advantage. Now we again have parity there. And the fact that it's so easy to actually adopt this technology without any barriers, which will mean that a lot more people will get on it a lot faster. So your time of competitive advantage is much shorter.

Riccardo: Okay, and if we were to focus more on the creative side of solving this problem, so how it enhances the creative process more than the innovative process.

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id_10: I think the creative process, it can be enhanced by... you know, how does a creative process look like? You set certain assumptions or you certain questions, then you try to validate or invalidate those. And in that process, using chatGPT is actually quite helpful because you get to your answers fairly quickly. So previously, if you could validate, let's say five assumptions in a day, you could now go through 50 because you're just a lot faster through it. So you can get a much broader grasp of the situation. Because you're able to zoom out much faster, like you cannot try to get a helicopter view of it all. Having said that, so that's the positive side. On the other hand, if we immediately go to chatGPT without ourselves thinking about the problem, we might get into the risk of just going with the proposal that we get instead of our own. And then we actually shut off our own creative thinking and I rely on chatGPT provides. And that's where my concern is that I don't consider that to be creative thinking anymore, because that is accessible to everybody.

Riccardo: This goes more in the second scenario that we're going to present you. I like this point a lot. But just to conclude, so when it comes to creating this a new idea or something novel, in this scenario in specific, how would you thinkchatGPT has a role in this process?

id_10: What role would it play? I think what it would be, I mean, depending on what you ask, it will probably be able to give you what your competitors are doing, or more broadly, what are the industry trends, what customer trends look like, what are the maybe even regulatory trends that are coming up, which you may not be aware of, depending again on the capacity of your team. So it might be able to give you new insights. So from that perspective, I do see the value of having chatGPT in your ideation process and validating some of the assumptions very quickly or misconceptions, right? If let's say somebody says certain numbers about like predicting costs and stuff like, you know, I did this for my business before I was looking at the costing of food businesses and I just kept on asking like, hey, well, you know, how much do businesses spend on inventory? How much did they spend on, let's say, cost of ingredients? What is the rent that they would pay in a city like this, you know, and get to these numbers. Now, do I know that they're true? No, then I have to again validate or cross validate with some of my friends on my own, the common sense, trying to figure that out.

Riccardo: I see. I see you use it more as a quick research tool, from what I understand, like you want to use it to grasp the estimation of real data.

id_10: Yeah. Yeah. It's a faster, more understanding. For me, it's about at this point, mostly about information retrieval in a more convenient way. That's my main use.

Riccardo: Awesome. Okay. We're going to have a question for you later that is more on this point. So keep it fresh in your mind. Scenario number two. This is, is it scenario number two? Yes, perfect. So yeah, in this scenario, you are a creative designer and you're tasked with designing a new logo for a company's upcoming service launch. You recently discovered that chatGPT provides you with a context-based response and could also retain information of your previous interactions, which you believe will help you streamline your workflow. Your main priority is to address all the requirements provided, but you find it challenging to keep track of everything without losing focus on the creative process. So in this case, in what ways do you think chatGPT helped or did not help you better address the client's requirements while maintaining focus on your creative process?

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id_10: I think chatGPT can be used for an onboarding process of the client, right? So that's something you can teach chatGPT to work for you, or you basically, or you ask chatGPT, what are the questions you may ask before you onboard a client? So you can run the whole process. Like you could do it through ChatGPT or you use the API in your own website. So you could actually off-board the entire onboarding of a project to chatGPT and that could be quite effective. So you're collecting all sorts of requirements without spending any time of your own, which can be a saving. On the other hand, that may affect also the, you may miss out on some other things, which are a bit more intangible. Like when you have a conversation with a person, you can feel their hesitations, you can feel the energy, you can feel the worries, which is something which doesn't get communicated over a chatbot. So on the onboarding process, it can be used, but I would say if you want to still remain a creative designer, I think ultimately it's the empathy and emotions that will save you or not for at least a short period. And it's not the perfection of the work because perfection of the work is not something that will be left to humans. Machines are more perfect than humans when it comes to that. Humans are more, hopefully more empathizing than machines. So that's the part which I still think that actually in this role, humans should take up. Like they can do a qualification questions through chatGPT, but the actual first interview should be in person or at least through video. So that's about requirement side. What you could also use with chatGPT is you can very quickly create different solutions or test certain ideas with the client. So almost have a real-time intake, like onboarding where you already propose certain ideas. So your customer says, Hey, I'm actually a, let's say a shop that sells, let's say vegan cookies. And this is what I stand for. You almost in real time can say, Hey, these are the three options that come to my mind. Which ones do you feel like going with? And that loop, so you create a lot faster iteration group loop, which can help you get to the customer's need a lot faster.

Riccardo: Okay. And in your example, you also feed a creativity with these requirements, right? Yeah. All right. So and then how do you think these, this capability of chatGPT to also remember what you what you, what you put in and what you fed before? How, how, how specifically would you assess this this capability of it? How did you maybe use it yourself? And how, how would you think it affected it?

id_10: You mean my previous conversations with it?

Riccardo: Yeah. The fact that it remembers more or less what you what you said before, and it keeps in your mind in this example is a requirement. So it makes sure that you don't go off of track, where you still can focus on on, on solving your problem without going out of the requirements, but still giving you freedom on the creative process, but maybe in decision-making process for you, for one of your experiences, if you ever use this capability and if yes, how did it help or not help?

id_10: I mean, I've used it when it came to well, I've used it to try to come up with the name for the business with descriptions or potential email communications. So it does remember to an extent though, I haven't, the problem with chatGPT is that you can't always rely on it. It doesn't always work. I mean, the free version at least. So I haven't, I normally actually give fresh, how do I say it? I haven't used that feature that much where I keep on talking about the same thing, right? Like I ask a lot of different questions.

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Riccardo: So you just create a new chat?

id_10: Yeah, I create new chats, exactly. And I don't know to what extent it remembers than the rest. So I don't rely on that.

Riccardo: Are you using the free model or are you paying for the plus model?

id_10: I'm using the free model, but I also use like Notion AI for a lot of stuff to just rewrite stuff or improve my writing.

Riccardo: Okay. Because this tool is way more functional in the new version, chat GPT-4. But yeah, that's fine like this. So you cannot say with confidence that there was a creative issue that you were able to surpass, to solve through this capability of it?

id_10: Not really. Not so far in my experience, no. But I do see how it could work. I mean, it could be that it's almost like your friend or even mentor who just keeps and guides you and remembers all the things that you said and makes sure that you're on the right path. I haven't yet trusted it enough to think of it like that.

Riccardo: Makes sense. Makes sense. It will get better.

id_10: A hundred percent. Yeah, absolutely.

Riccardo: Okay. Awesome. And then over to the third and last scenario. In this case, you are a, I mean, until now, are there any questions? Is everything going good?

id_10: Yep.

Riccardo: Okay. Awesome. Anything unclear, you can just let me know. In this case, you are a customer support specialist at a tech company that provides software solution for small businesses. Your role involves assisting clients with troubleshooting issues, answering inquiries, and providing guidance on how to use the software effectively. To help you manage the high volume of support requests and provide real-time assistance to clients, your company has implemented chatGPT Plus with its rapid response feature. The goal is to enhance the quality of the support you're producing response time. In this case, I want you then to focus on this capability of chatGPT Plus to give you this rapid response. How do you think chatGPT affects your ability to provide these real-time support and feedback to clients compared to your previous workflow?

id_10: It speeds things up significantly. You know, the customer support is very important to identify, well, it's important to get to your client as fast as possible and identify the problem that they're facing. And very often, we had a bottleneck there that we had like, I mean, still most companies you call, you're on a waiting list because they're not able to get to your problem fast enough. chatGPT, you know, is miles ahead of all the other chat bots, which normally were on websites, which were dumb and you asked three questions, and it says, please leave your number, we'll call back. Meaning that it previously couldn't handle the complexity of the request, but now I think it is there. And overall, the entire customer service space will change very significantly. So I think on problem qualification again, it, we don't need humans for that at all. And that should be left to the machine and quickly, you know, if once you have identified the problem, then you like

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think of what are the solutions. Sometimes it's about information. So just give it back to the customer and they're happy. Sometimes it's a physical action. Now, if there is a physical action, then maybe we need human to execute on it until robots pick up in the future. So building right workflows where the demand side is taken care of can be very effective. The only thing so, and by doing that, hopefully about 80% of the requests will be automatically taken care of. Now, what I would still put as a person on top, just to make sure to review the response rate, how, what's the quality of it. And if you see that the customer is struggling, like there should be mechanisms to show that like customers rewriting the same request in different ways, trying to explain it or is getting frustrated. There should be a quick way to, you know, recover the situation.

Riccardo: And now you are imagining the chat bot, right? That it's been used in the chat bot. And now I want you to imagine that you are providing this kind of solutions as a customer support specialist through calls. So it's actually human interaction, but you as a specialist have access to chatGPT. So it's the fact of, it's basically, imagine you, you are still trying to solve the novel issue of your, of your small businesses then want a solution from your company, but you also have access to this fast responding. Yeah.

id_10: It improves your, yeah. I mean, then we really reduce the person to just a walking microphone, which is probably not the best use of their time. You know, so...

Riccardo: I mean, the issues that he has to solve are not always like very simple in the sense that they just require information. It's more that of, of connecting the demands of the client and then finding up, finding out something novel that the person is, the customer support specialist comes up with.

id_10: I think in principle, I mean, it can definitely enhance the process because in customer support anyways, like you are given a blueprint of responses or you're given some sort of a system where you check the orders, where you look at where, you know, like process, where the issues are, what you try to predict the issues. The problem is that not, not all of these solutions are very quick and very intuitive. So this can reduce significant reduction. Like again, the customer service representative is much faster to answers. And also the training required for them to do their jobs should significantly get reduced as well. So that's the business benefit of it, I guess.

Riccardo: So then it's just gets faster.

id_10: Faster. It could potentially even offer a solution, which the, the representative himself or herself didn't think of. So going a little bit out of template, but haven't been in that situation yet. So don't know.

Riccardo: Okay. And now the big question, how would you compare the, this workflow in this case with collaborating with a human colleague instead, how would efficiency be affected in this case? So yeah, if that's clear enough.

id_10: I would prefer a smart robot over stupid human. Okay. So no, I mean, it's, it's a one-liner, but the point is that I don't want to, for me, to be honest, it doesn't matter who is on the other side, as long as my job is done. So if that means that they, we can train chatGPT or the robot to do the job very well, and that I feel that I'm understood and I feel that I can

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trust their decision, then I'm completely fine. I only need a human if I don't feel the truth, like the trust and the understand.

Riccardo: Well, as a customer, you are already interacting with a human. Like it's never an option to just interact with the language model.

id_10: Oh, then I...

Riccardo: The, the, the support specialist has just access to it.

id_10: I see. Yeah. And coming up with, with a new way of solving the issue that is presented by the client, he has access to this.

id_10: I would say, I mean, nice. Now we have two brains or many brains that the same problem, so why not?

Riccardo: And how would you compare this ability of chatGPT compared to a collaboration with a human behind the desk with another human? What aspects do you think changed? What is, yeah, what is the difference in this?

id_10: ChatGPT will probably be actually be more reliable. Because humans of the day could be back to a certain way versus the beginning of the day. They have, you know, like there, you have to take into account their personal feelings. Maybe the call before this was actually shit and they're, they just don't want to talk to you anymore. So you have to take into account those personal elements, which you would hope with a response from a robot response from a robot would be much more, you know, it wouldn't matter. So I would even prefer this from a consistency perspective.

Riccardo: Okay. So consistency, I see. Any, any other aspects apart from consistency?

id_10: Speed. Not often they say like, oh, I need to talk to my colleague and then you're listening to music for 15 minutes. So hope that is taken care of. This is assuming that chatGPT is properly implemented under the process of that company are well known, right? That it actually works. If it doesn't give me like, you know, either you train a human or you train a machine, both of them have to be trained to be able to give the right responses. So, so if it's an equally trained human and a machine, then I would prefer a machine because it doesn't have the disadvantages of the human.

Riccardo: Okay. And don't you think there's also disadvantages with the machine in this scenario? I mean, we talked about it without, without repeating the ones we already touched upon before.

id_10: In this case, I feel like the questions that a customer support specialist would answer are quite they're in the boundary almost, right? So you can predict the types of questions and the complexities of those questions. So therefore I'm not that worried about the quality of answers. You're not trying to ask it to create you the next, I don't know, Salvador Dali painting. You know, they're fairly predictable paths. So, so I don't see many disadvantages here. Well, you could think of the, for the company, if it's actually going to chatGPT, does it leak customer or your data and the company's data into a broader pool, a different conversational together?

Riccardo: Of course, of course. So, because now it's if you read the terms of conditions, one of the first points is to not share personal or corporate

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information, which is probably the main thing that this machine is being used for.

id_10: Right. And so, yeah. Well, yeah, I think that's right. That wraps it up. I'm just thinking maybe on the extra questions. Yeah. Maybe some, some of your experience, maybe it is a little bit different from the scenarios, but I want you to focus on your experience in specific. What tool, what capability of chatGPT really stands out in the problem solving, the creative process that you, when, when you use it, let's say, what, what is something that you say, oh, that this feature is really something that stands out?

id_10: I think in the creative side is just how fast you can create all sorts of content, right? From written content to visual content to video content, you can go from text to video within 15 seconds. And just that pace of it is both exciting and kind of scary because it creates a major, yet another information inflation and a whole new dimension. So that is for companies that are smart to use it now. Great. You can build up your socials very quickly and you know, getting traffic as many companies are doing that. But then I also think very soon it will be, I mean, it's visible and you, you can, if you're not very crafty at using the prompt, you may quickly lose your own identity as a brand. So how do you maintain some sort of a brand identity, which is unique to you while using these tools? That's a bit of a question.

Riccardo: Okay. So do you think it's a, there's a limit to the originality, the novelty of content that you can create with the help of?

id_10: For now, that's what I've noticed. But then again, I haven't spent that much, like my prompting, I've never spent more than 15, 20 minutes on prompting or not even, I would say five minutes in prompting, like I just ask and there's like, okay, this is it. And then I start thinking myself, what can I do with it instead of improving the prompts and maybe we can get to even better strong prompts. And especially on the visual side of things, it's hasn't yet, I mean, it's definitely fascinating. I see where it's going, but I personally use it less on creative side. I use it more on operational side, like I need to draft an email. I'll draft it up as I think, and then I'll check what are the options that chatGPT can provide. Maybe I like some phrases. I'll put that together. And here is my email. So that's more of a personal goal. I still want to keep, maybe that's, yeah, like I want to keep the creative thinking, actually not outsource my creative thinking because that's what I'm here for.

Riccardo: And of course. All right. Perfect. Okay. Unless you don't have any other remarks, questions or topics that you think we didn't cover enough. No, I'm just curious, how do you plan to use this to combine into a thesis, I guess, well, or do you feed it all into chatGPT and see what comes out of it?

10.4. Research Repository

Access my research repository online here:

<https://drive.google.com/drive/folders/1-AKnvcOf0Gw1wUz4F1f91yRNhXr138GY?usp=sharing>