

MDDM

Master's Degree Program in
Data-Driven Marketing

**Creativity and Problem-Solving in Advertising:
The Impact of ChatGPT within the Design Thinking Framework**

Ana Catarina Benvindo Casquinha

Master Thesis

presented as a partial requirement for obtaining a Master's Degree in Data-Driven Marketing

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação

Universidade Nova de Lisboa

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by
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Master Thesis presented as partial requirement for obtaining the Master's degree in Data-Driven Marketing, with a specialization in Marketing Intelligence.

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February, 2024

STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledged the Rules of Conduct and Code of Honor from the NOVA Information Management School.

Lisbon, 22/02/2024

DEDICATION

One of my main goals was to achieve a Master's degree, a task I initially believed would be straightforward for me. Historically, I've excelled academically, never faced significant issues with my study habits, and have always been characterized by my strong focus and dedication. However, the past two and a half years have introduced a series of challenges, placing obstacles in my path that I've managed to navigate with considerable effort. Striking a balance between a demanding job, maintaining a social life, pursuing physical fitness, engaging in more reading, and dedicating time to my family—all while returning to my studies—proved to be a challenging endeavor. There were moments when my motivation waned, but I remained steadfast in my commitment to this goal.

This journey would not have been possible without the unwavering support of the extraordinary individuals in my life. I am deeply grateful to my parents, grandparents, boyfriend, his family, and my friends for their constant encouragement and positive outlook. Their belief in my potential was a source of strength, helping me to persevere through the most challenging periods.

I must also express my gratitude towards my dog, whose companionship and emotional support were invaluable to me during this time.

Thank you all so much.

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In the journey toward completing this project, I have been fortunate to receive guidance, support, and assistance from a number of esteemed individuals and groups, to whom I owe a debt of gratitude.

I extend my sincerest thanks to my advisor, Prof. Nadine Côte-Real, whose expertise, patience, and insight have been essential. I am also profoundly grateful to my workplace for fostering an environment that values learning and development. The support and flexibility offered by the organization have been critical in allowing me to balance my professional responsibilities with my academic pursuits. My colleagues also deserve special mention for their assistance and encouragement. Lastly, I wish to acknowledge all the professionals who generously offered their time and expertise to assist me with this project. Their prompt and willing support played a significant role.

To each of you, I express my deepest appreciation for your invaluable contribution to my journey.

ABSTRACT

In the context of the impact of creativity in advertising, this thesis focuses on the incorporation of Generative Artificial Intelligence, in particular OpenAI's ChatGPT tool, within the Design Thinking framework. Through a qualitative analysis, including interviews with advertising professionals, the study explores the synergies between generative AI technologies and creative processes and problem-solving. It identifies key benefits, such as the tool's support for idea generation, workflow efficiency and time optimization, while acknowledging significant challenges, such as ensuring creative integrity and managing the limitations of AI technology. The research highlights the key role of human supervision in harnessing ChatGPT's potential to complement human creativity, proposing an updated Design Thinking framework that integrates GenAI tools to promote innovation and efficiency in creative practices. This comprehensive analysis not only sheds light on the operational and creative advantages of ChatGPT but also addresses the concerns and challenges associated with integrating AI into the creative industry.

The findings contribute to the ongoing update of traditional processes on the intersection of technology and creativity, offering valuable insights for advertising professionals aiming to harness AI's potential while maintaining the human essence.

KEYWORDS

ChatGPT; Design Thinking; Advertising; Creative Problem-Solving; Generative AI; Workflow Optimization; Human-AI Collaboration; Artificial Intelligence.

Sustainable Development Goals (SDG):



TABLE OF CONTENTS

Statement of Integrity	i
Dedication	ii
Acknowledgments	iii
Abstract	iv
Table of Contents	v
List of Figures.....	vii
List of Tables.....	viii
List of Abbreviations and Acronyms.....	ix
1. Introduction.....	1
2. Literature review	3
2.1. Design Thinking Overview	3
2.1.1. A Human-Centric Approach.....	5
2.1.2. The Design Thinking Stages	5
2.1.3. Design Thinking applications in different areas	8
2.2. Generative Artificial Intelligence.....	9
2.2.1. ChatGPT	10
2.2.2. ChatGPT's Limitations	11
2.2.3. ChatGPT's applications in different areas	12
2.2.4. ChatGPT integration in Design Thinking for the advertising industry.....	12
3. Methodology	14
3.1. Research Motivation	14
3.2. Research Methodology	15
3.3. Participant Selection.....	15
3.4. Company Selection	16
3.5. Investigation's Output	16
4. Empirical Study	17
4.1. Study Design	17
4.1.1. Research Objectives	17
4.1.2. Premises	17
4.2. Sampling Method	18
4.2.1. Intentional and Stratified Sampling	18
4.2.2. Participant Sample	19
4.3. Data Collection	20

4.3.1. Initial Contact and Invitation Process.....	20
4.3.2. Benefits and Limitations of Email-Based Data Collection	20
4.3.3. Interview Questions	21
4.4. Data Analysis	21
4.4.1. Qualitative Content Analysis with TQF.....	22
4.4.2. Coding process	23
4.4.3. CATEGORIZATION PROCESS	25
4.4.4. LIMITATIONS OF THE DATA ANALYSIS PROCESS	26
5. Results and Discussion.....	28
5.1. Overview.....	28
5.2. Results	29
5.2.1. Enhancement of Creative and Problem-Solving	29
5.2.2. Workflow Optimization	30
5.2.3. Challenges and Limitations of AI Integration	30
5.2.4. Integrating ChatGPT into Design Thinking Stages.....	32
5.3. Discussion	33
5.3.1. Overview of Key Findings	33
5.3.2. The integration of ChatGPT in the advertising industry’s workflows	34
5.3.3. The impact of ChatGPT specifically on problem-solving creativity.....	35
5.3.4. The Integration of ChatGPT into the Design Thinking Framework	35
5.3.5. The Challenges of ChatGPT in the Design Thinking Process	37
5.4. AI-Driven Design Thinking Framework.....	37
5.4.1. Introduction to AI-Driven Design Thinking Framework	37
5.4.2. The foundation of the AI-Driven Design Thinking Framework	39
5.4.2.1. Framework Adaptability	40
5.4.2.2. Responsible AI Use.....	40
5.4.3. Framework Limitations.....	41
6. Conclusions and Future Works.....	43
Bibliographical References	45
Appendix A: Questionnaire Invitation.....	50
Appendix B: Questionnaires.....	51
Appendix C: Codebook	61

LIST OF FIGURES

Figure 1- Interest in “Design Thinking” over time (last 10 years) by Google Trends.....	3
Figure 2 - The Five Phases of the IDEO/d.school Design Thinking Process.....	6
Figure 3- Interest in “ChatGPT” over time (last 5 years) by Google Trends	10
Figure 4 - Stratified Sampling by Scribbr (Thomas, 2023).....	18
Figure 5 – Phases in qualitative content analysis in TQF (Roller & Lavrakas, 2015).....	22
Figure 6 - Categorization of codes.....	26
Figure 7 - Research Key Findings.....	34
Figure 8 - AI-Driven Design Thinking Framework.....	41

LIST OF TABLES

Table 1- Interview’s Sample 19

Table 2 - Interview Questions 21

Table 3 - AI-Driven Design Thinking Framework Stages 39

LIST OF ABBREVIATIONS AND ACRONYMS

AI	Artificial Intelligence
DT	Design Thinking
GAI	Generative Artificial Intelligence
GAN	Generative Adversarial Network
GEN-AI	Generative Artificial Intelligence
GPT	Generative Pre-training Transformer
LLM	Large Language Models
LR	Literature Review
NLP	Natural Language Processing
P1	Premise one
P2	Premise two
TQF	Total Quality Framework

1. INTRODUCTION

In this ever-changing world, teeming with cutting-edge technologies, initial research suggests that Artificial Intelligence (AI) has the potential to bring immense value and serve as a formidable ally for revolutionizing business (Kuczmarski, 2003). Beyond its widely recognized applications in our daily routines – think robots, chatbots, and self-driving vehicles – artificial intelligence has taken strides toward aiding us in our day-to-day tasks (Zhang & Lu, 2021). As we navigate through an era of constant transformation and advancement, it is crucial to acknowledge the role that AI can play in propelling businesses forward. With its ability to analyze vast amounts of data at lightning speed and make informed decisions based on patterns and trends unseen by human eyes alone - there's no denying the impact it could have on driving innovation (Bughin et al., 2017).

In November of 2022, OpenAI revolutionized the market and launched one of the best-known AI tools for generating content – ChatGPT-3. This type of AI is capable of reproducing human language creating written content of astonishing quality. ChatGPT, a sophisticated and globally recognized linguistic model, has captivated minds around the world with its ability to generate human-like text (OpenAI, 2022). Its emergence on the global stage prompts us to reassess the boundaries of AI's capabilities, venturing into realms that were once thought to be the exclusive province of human intellect (Chui, 2023).

However, as attention on AI's capabilities intensifies, exploration of its application in some traditional humanized processes, such as Design Thinking methodology, remains markedly scarce, creating a research gap that is intriguing and worth investigating (Verganti et al., 2020). Despite a growing body of literature on the pragmatic applications of Large Language Models (LLM) in a myriad of sectors, there is a gap in the application of ChatGPT in problem-solving and creative thinking methods.

Nowadays, businesses are highly dependent on constant evolution, updating of methods, and innovation in the services or products they offer to remain competitive.

For this very reason, various methods have been developed to help create thoughts and methods for innovation, creativity, and rapid problem-solving.

One of the most studied and well-known academic processes is the Design Thinking process, which is a methodology that suggests stages that lead to the development of new, unique, efficient as well effective ideas (T. Brown, 2008). Although there are a few approaches to the framework of the DT process (Johansson-Sköldberg et al., 2013; Liedtka, 2014), there is a classic proposal developed by a world-renowned college - D.stanford School (Johansson-Sköldberg et al., 2013).

This study looks for a research gap, embarking on a mission to elucidate the potential integration of ChatGPT on the Design Thinking human-centered process. This investigation sets out to redefine the DT framework in the context of ChatGPT integration advertising agencies. The main objective of this thesis is to explore and analyze the application of integrating ChatGPT, a generative AI model, within the Design Thinking process, aiming to provide a revised framework that potentially enhances creative problem-solving for advertising agencies.

Thus, the research question is: How does the integration of ChatGPT into the Design Thinking process influence creative problem-solving in advertising agencies, and what are the potential benefits and challenges of this integration? The potential hypothesis of this research is that incorporating ChatGPT into the Design Thinking process can lead to a more dynamic and efficient problem-solving structure, promoting greater creativity, deeper knowledge, and more comprehensive solutions.

2. LITERATURE REVIEW

2.1. DESIGN THINKING OVERVIEW

Design Thinking is an iterative approach that looks into understanding users, challenging the assumptions, and find alternatives to problems. The purpose is to identify special ways and solutions to problems and questions and understanding the people to whom products are made is central to design thinking (Dam & Siang, 2022).

The increase in literature on Design Thinking in recent years has been substantial, with a surge in popular management books and articles in leading business publications such as The Economist and Harvard Business Review (T. Brown, 2008). This surge reflects the widespread application of Design Thinking across various fields and its extensive study in universities as a method for innovation (Liedtka, 2014). The growing interest in Design Thinking is evident from the increasing number of practitioner writings and academic publications that mention the term "design thinking" (Mahmoud-Jouini et al., 2016).

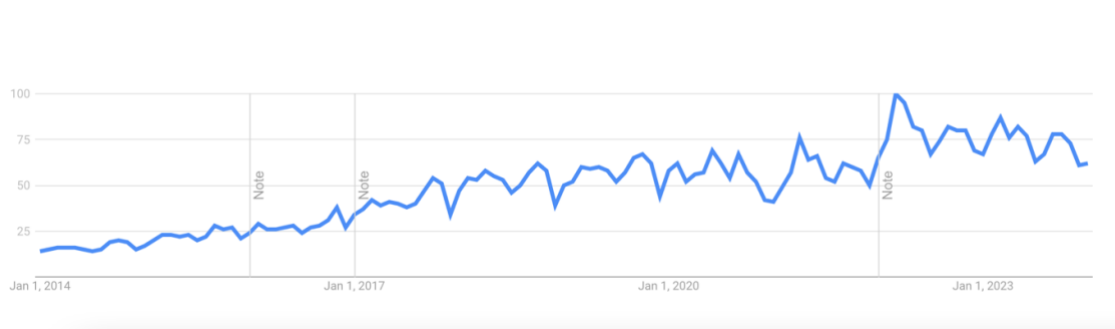


Figure 1- Interest in “Design Thinking” over time (last 10 years) by Google Trends

Furthermore, the application of Design Thinking has been reported in major organizations, including P&G, Samsung, and others (Micheli et al., 2019), and has been recognized as a way to problem-solving definition. DT has been also recognized as a method for innovation in various sectors, including healthcare (Altman et al., 2018) and education (Clark et al., 2020), and empirical evidence supports the relevance of Design Thinking for innovation activities (Roth et al., 2020). The methodology of Design Thinking has been recognized as a method of creating innovative and original ideas that respond

to the demand that is growing in companies and organizations (Lim et al., 2022). Also, it emphasizes the need for experimental studies involving Design Thinking to understand further its impact (Clark et al., 2020).

The concept of Design Thinking, while widely discussed, lacks a universally recognized definition, and even its label is debated among those who use and support it (Liedtka, 2014). Peter Rowe, a Harvard professor in architecture and urban planning, was one of the first to use the term in a significant way (Peter G. Rowe, 1987), but his focus was on architectural design, which differs from the contemporary business application of the term. It's more accurate to link the current business-focused interpretation of Design Thinking to the innovation consultancy IDEO, under the influence of its founders David Kelley, and Tim Brown.

Despite its widespread use, there is a lack of concrete definitions from its early champions. They often describe design thinking in vague terms, referring to it as what designers engage in, or applying designers' methodologies to problem-solving (T. Brown, 2008). Others offer a more formal definition, seeing it as the use of design methods by diverse teams across various innovation challenges (Seidel & Fixson, 2013).

Design Thinking has been recognized as an approach human-centered around people's needs, drawing on design principles for fostering innovation. Although it has been adopted by numerous large companies in recent years, there are still few empirical studies on its implementation in organizational environments, which leads to a limited understanding of its effects when integrated into business practices (Seidel & Fixson, 2013).

In discussions among business executives, DT is not often associated with the traditional domains of design, such as engineering, industrial design, or communication design. Instead, it is portrayed as a human-centered, widely applicable methodology for increasing creativity and promoting innovation (T. Brown, 2008). Prestigious institutions

such as the Rotman School of Management and Stanford University have launched Design Thinking programs. These programs are built around more prescriptive models of DT, incorporating frameworks equipped with specific tools and highlighting the importance of a human-centered innovation process and the collaboration of interdisciplinary teams (Camacho, 2016).

2.1.1. A Human-Centric Approach

The design thinking places the user in the middle and it involves understanding the needs and perspectives of the users together with cross-functional team collaboration, a culture of experimentation, and iteration.

Another main value of design thinking is empathy which enables the designers to comprehend how the users feel, relate effectively, and think of a product or service (Elsbach & Stigliani, 2018).

Empathy allows seeing the user's problem through other's eyes thus yielding valuable input on the design process resulting in innovative user-friendly designs and solutions (Dam & Siang, 2022). By employing empathy, designers put themselves in the place of the users, explore the users' feelings, and offer responses addressing what people need and want which defines DT as a human-centered approach (Carlgren et al., 2016).

2.1.2. The Design Thinking Stages

In the context of Design Thinking research, it is clear that numerous variations of the process are currently in use, ranging from three to seven distinct phases and more static or dynamic modes (Johansson-Sköldberg et al., 2013; Liedtka, 2014).

Stanford's d.school stands as a pioneering institution, especially because of its unique, hands-on approach to Design Thinking, deeply rooted in empathy and human-centric design. The Stanford d.school's framework, distinguished by its innovative blend of 5 steps (empathy, define, ideate, prototype and test), aligns seamlessly with the challenges and opportunities my research aims to address (Stanford d.school, 2018).

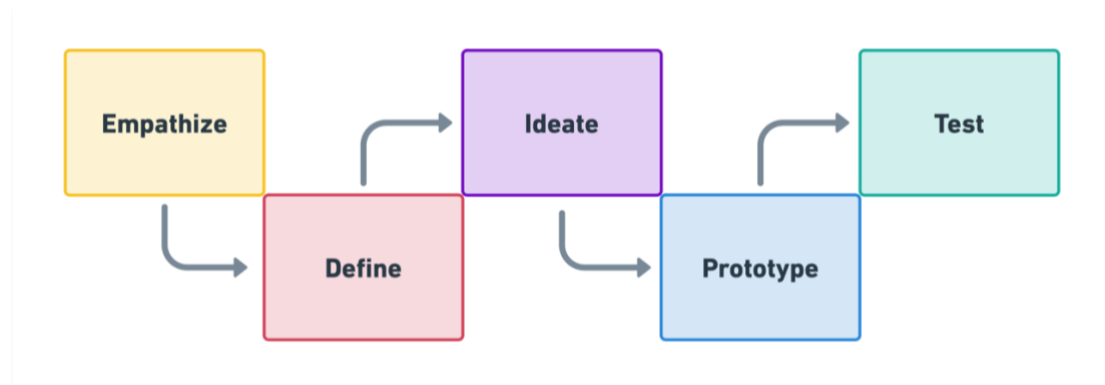


Figure 2 - The Five Phases of the IDEO/d.school Design Thinking Process

1. Empathize

Empathy stands as the bedrock of design methodologies centered around human needs. To obtain empathy, the approach entails observing - watching users in their day-by-day environment to grasp their behaviors, interacting - engaging with users, and experiencing - stepping into the shoes of the person to recognize their studies. In a human-focused process, it is crucial to have a deep understanding of the people for whom the designs are meant because the challenges addressed are usually faced by specific users, and not the designers themselves. Observing individuals in their environment sheds mild on their actions, emotions, and needs and these insights are key to crafting revolutionary solutions.

2. Define

During the “define” stage, designers take into account everything that they have noted down in the preceding “empathize” phase. In this stage, various insights obtained from users are assembled to form a succinct yet usable problem statement. In other words, it is about defining very well the problem or opportunity. This process involves the analysis of collected information to determine what trends and learnings arise from users’ actions, sentiments, and thoughts. These insights have now been framed in such a manner to direct the design process leading usually to a point of view statement.

3. Ideate

The Ideate stage is characterized with the aid of its open, brainstorming nature, in which the aim is to discover an extensive spectrum of opportunities, encouraging divergent thinking and pushing past obvious answers to uncover innovative approaches. The

ideation is not about immediately finding the right answer but generating ideas and exploring many different directions for the same insight.

During Ideate phase, various techniques and tools can be employed to stimulate creative thinking such as brainstorming sessions, mind mapping, sketching, role-playing, or using analogies and metaphors.

The emphasis is on quantity over quality at this point, under the principle that a large number of ideas increases the chance of developing a truly effective and innovative solution. The ideas generated are then used as the foundation for the subsequent stages of prototyping and testing.

4. Prototype

Prototype means giving life to thoughts – turning them into real stuff that can be explored. In this stage, prototypes may be as basic as drawings or highly interactive representations of the model based on the complexity of the solution and available resources.

These prototypes are however made quickly and cheaply to help designers to delve into several elements within their ideas and identify what works and what does not.

Experts should be able to point out any problems observed during the prototype phase at its completion point and any issues remaining unresolved.

5. Test

In the Testing stage, users are given prototypes to use, while their interaction and feedback are closely monitored. The main goals here are to gather user feedback, ideally explore their experience, and assess how the proposed solution fares in a real-use situation. Although this stage marks the end of the five-stage design thinking model, it is important to remember that design thinking is cyclical, and insights gained can often redefine problems or some pain points of a project. This deeper understanding can shed light on how users interact with the product and their thoughts, behaviors, and emotional responses to it and such insights may prompt a return to earlier stages of the design process. Continuing further iterations, the process involves adjustments and refinements, possibly considering other solutions.

2.1.3. Design Thinking applications in different areas

Design thinking is catching on these days, especially for spurring new ideas and solving problems in various areas. It has not only gained significant attention and interest from academics (Micheli et al., 2019), but has also been widely applied in fields such as business, education, health, sustainable development, and the creativity industry (Bahrini et al., 2023).

DT has gained attention for its application to drive innovation encourage and address innovation challenges (Seidel & Fixson, 2013), and its applications in manufacturing, product, and service design have been praised indicating its importance, for example, in commercial product design (Pratomo et al., 2021). In addition, DT has been recognized as useful for project and creativity success, although it has been criticized for deviating from the standard business processes, making implementation difficult (Roth et al., 2020).

There is a call in education to pay more attention to the application of design thinking, especially in business education, as it is effective in enhancing students' creativity and entrepreneurial orientation (Pratomo et al., 2021).

Furthermore, in the context of sustainability, it is a potentially flexible approach to addressing sustainability challenges and is widely applicable to innovation and solving problems (Clark et al., 2020). The use of design concepts in healthcare has shown positive results, with users reporting greater satisfaction with the design thinking interface as well as increased productivity and effectiveness (Altman et al., 2018).

Design thinking methodology has a significant influence on the creativity industry by fostering creativity, innovation, and problem-solving. A. G. Lafley, the former CEO of P&G, emphasized that design thinking promotes creativity and innovation in products, services, and organizational approaches (Micheli et al., 2019). This is achieved through a divergent phase in the design thinking process, which aims to generate multiple ideas and reframe problems to envision potential solutions (Dell'Era et al., 2020), where

professionals and researchers emphasize the need for theoretical frameworks to enhance and teach creative thinking strategies.

2.2. GENERATIVE ARTIFICIAL INTELLIGENCE

The business landscape in the 21st century has undergone significant transformations, primarily influenced by technological advancements, including the rise of artificial intelligence which has been improving the efficiency, productivity, and quality of processes and workers' outputs (Lee et al., 2018).

The evolution and broadening of machine learning have paved the way for advanced technologies in digital content creation, particularly in generative AI (McKinsey & Company, 2023). Generative AI models operate on unsupervised or semi-supervised machine learning techniques, producing human-like artifacts through statistical and probabilistic methods (Goodfellow et al., 2020).

Among various generative AI models, two prominent types are the Generative Adversarial Network (GAN) and the Generative Pre-trained Transformer (GPT) (Abukmeil et al., 2021, Jovanovic & Campbell, 2022); Sun et al., 2017). GAN, commonly used in generative AI applications, employs dual neural networks—the generator and the discriminator. The generator creates outputs, like facial images, while the discriminator evaluates their authenticity. This process continues until the discriminator cannot distinguish between synthetic and real outputs, ultimately considering the synthetic as real (Wang et al., 2017; Liu et al., 2023). Therefore, GANs are extensively utilized in generating data-driven voice, graphics, visuals, and videos.

On the other hand, GPT models harness extensive quantities of publicly available digital information for natural language processing (NLP), allowing them to produce text that closely resembles human writing in multiple languages (Hirschberg & Manning, 2015). These models demonstrate remarkable writing abilities, ranging from crafting paragraphs to composing entire research articles on diverse topics (Aydin & Karaarslan, 2023). GPT-3, an advanced iteration of these models, boasts 175 billion parameters, surpassing previous models in task-agnostic capabilities and rivaling the best fine-tuning

methods (T. B. Brown et al., 2020). Subsequent sections will delve into an overview of ChatGPT, its potential to enhance creative industries, its limitations, and how professionals might leverage it to streamline business processes.

In conclusion, there are several potential benefits of using Generative AI (GAI) nowadays, that can lead to efficiency improvements, time savings, and cost reduction. GAI can also raise the bar from innovators' work, to enhance customer experiences through personalized marketing campaigns and even improved customer service. Finally, GAI can reshape the roles, potentially leading to new opportunities for innovation and creativity (Kanbach et al., 2023).

2.2.1. ChatGPT

OpenAI ChatGPT was released a few months ago, and many top business leaders have stated that it would transform our lives and the way we work. ChatGPT is an extension of the generative artificial intelligence (AI) family, which includes tools for producing text, code, graphics, audio, and video material, among other types of information (Korzynski et al., 2023). As Google's rival ChatGPT, Bard is also based on transformer technology, which is a neural network architecture that generates predictions based on inputs. ended up gaining a greater reputation due to its early open-source tool condition.

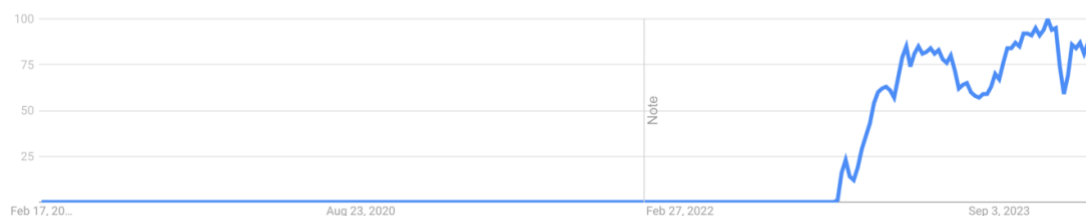


Figure 3- Interest in "ChatGPT" over time (last 5 years) by Google Trends

Generative Pre-training Transformer (GPT) stands out as a Large Language Model (LLM) as a result of its extraordinary dimensions and the massive volume of data that was applied in its training. As one of the largest language models in the world, GPT relies on billions of data sources since the algorithm that drives it has access to the whole Internet. GPT is a versatile software that may be used for a range of language-based tasks, such as question-answering, translation, and text production. (Lund et al., 2023). Its use of deep learning methods and advanced algorithms sets it apart from other language processing tools by allowing it to comprehend the context of a document and provide replies that seem human.

By training ChatGPT on additional data and enhancing its algorithms, OpenAI aims to improve its precision and reliability. In addition, it's critical to remember that ChatGPT is a tool and should not be utilized in place of human intellect or judgment. Instead, it should be used sparingly and in tandem with human oversight and evaluation (Haleem et al., 2022).

2.2.2. ChatGPT's Limitations

While it holds great potential, it also risks reinforcing and magnifying pre-existing societal biases and inequalities, which could adversely affect educational processes and outcomes. For instance, if the training data for a model is prejudiced in favor of certain demographics, the output may exhibit bias against others (Kasneci et al., 2023). Therefore, it's crucial to guarantee that data used for training or fine-tuning on specific tasks is inclusive and reflective of diversity. Consequently, human supervision is essential and vital in reducing bias and ensuring the positive use of large language models in educational settings. And saying that, several concerns have been raised about the use of AI and ChatGPT in education, for example. Some educators worry that these technologies could lead to a decrease in educational activities and foster laziness among teachers and students due to reduced analytical skills (Grassini, 2023). Additionally, ChatGPT has significant limitations as a research tool because sometimes

it gives incorrect answers, suggests nonexistent sources and can be overly sensitive to arbitrary differences in prompt phrasing (Gordijn & Have, 2023).

There are also several ethical concerns and potential risks associated with using ChatGPT. This encompasses concerns related to privacy and security, ethical dilemmas, the potential for mistakes or misinterpretations, the likelihood of biased suggestions, and the danger of plagiarism (Bahrini et al., 2023). To address these concerns, it is important to have clear ethical guidelines and regulations in place to ensure that ChatGPT is used ethically and responsibly.

2.2.3. ChatGPT's applications in different areas

Despite its limitations, ChatGPT has a lot of capabilities that have been used in various fields, such as education, health, and psychology. In the field of education, for example, the tool has been used for conducting research and as an auxiliary in studying and teaching methods (Aydin & Karaarslan, 2023). The influence and impact of the application of this GAI tool on education methods and processes have been approached in every research article because of its impact on traditional and even scientific education (Cooper, 2023). ChatGPT has a wide range of potential applications across various industries, especially in the business world (Shaji George et al., 2023) and problem-solving industries which is the area this research will focus on. Because of its capabilities of synthesizing information, data analysis, and content generation, this tool can be used in many different tasks such as operations management, business analytics, marketing analysis, strategic thinking, and others (Bahrini et al., 2023).

2.2.4. ChatGPT integration in Design Thinking for the advertising industry

Specifically, in the ChatGPT case, it is an innovative Generative Artificial Intelligence (GAI) tool that has been used by many advertising agencies' professionals nowadays, since its launch in November 2022. Not only for brainstorming and generating content (Fattepure, 2023) but also for information providers. This tool became viral because of

its utility and free access to everyone, however, there is still no research made on its application in creative advertising and project management jobs.

Now focusing on the main capabilities of DT - observe, frame and reframe, imagine, design, and experiment (Beckman, 2020) –, it can easily lead to a functional tool for creatives who want to create novel ideas and as well for marketers or project managers who need problem-solving methods (Mahmoud-Jouini et al., 2016). Although there are many reframing proposals for Design Thinking (Johansson-Sköldberg et al., 2013), there is no research done about the reframing of the DT process including the ChatGPT as a tool to enhance its utility.

The importance of AI lies in its ability to overcome certain human limitations, enhancing human performance through data-driven solutions and tools (Samuel et al., 2023). However, as we can see in Design Thinking's literature review, empathy, and human approach are one of its core values, so can a GAI approach be integrated into this process?

3. METHODOLOGY

3.1. RESEARCH MOTIVATION

In recent years, the business landscape has experienced a transformative shift with the advent of AI technologies, notably in how they augment creative and management processes within organizations. At the agency where I currently work, a Portuguese advertising agency, we have embraced a creative and problem-solving methodology that closely aligns with Design Thinking principles. This approach has not only catalyzed innovation in our creative team but has also shown potential for application in project and client management. Building on this insight, this research proposes an innovative integration of DT across our agency's creative and project management teams.

This agency, with more than 12 years of experience in the national and international market, works with the most diverse clients in the most diverse business areas. It is made up of 40 employees, divided into creativity, project and client management, and accounting departments. Although they have different tasks, these departments have one thing in common: the need to solve problems, whether creative or operational. The cornerstone of this proposed integration is the incorporation of ChatGPT, an AI tool that has gained significant traction. ChatGPT's versatility and widespread adoption within our agency make it an ideal candidate for this integration. The rationale behind choosing ChatGPT hinges on its proven effectiveness in enhancing creative brainstorming, decision-making processes, and operational efficiency.

However, despite its growing popularity and apparent potential, a notable gap exists in the literature and practice regarding the application of ChatGPT within the DT process. This research aims to bridge this gap by exploring how ChatGPT can be effectively integrated into the DT methodology. By doing so, we seek to not only optimize our internal processes but also contribute to the broader discourse on the synergy between AI tools and design thinking in organizational settings.

This study, therefore, embarks on a journey to explore and document the potential benefits and challenges of integrating the ChatGPT into the DT process. The goal is to

provide a comprehensive framework that can be adopted by our agency and others in the industry seeking to leverage AI tools within their design and management practices.

3.2. RESEARCH METHODOLOGY

This study aimed to understand the integration of ChatGPT in the Design Thinking process within the advertising industry and to achieve this, it adopted a qualitative exploratory approach. Also, in line with the Total Quality Framework (TQF) principles, this study incorporates Credibility, Analyzability, Transparency, and Usefulness during its research process (Roller & Lavrakas, 2015). This approach allows for an in-depth exploration of experiences and perceptions, crucial for Credibility by uncovering insights. While this approach prioritizes depth over statistical generalizability, its findings will lay the groundwork for future quantitative or mixed-methods research. Analyzability is achieved through data processing methods ensuring accurate and complete analysis and also the principle of Transparency is rigorously applied, detailing every aspect of the research process - from the initial design and selection of participants to the execution of data collection and analytical procedures. Lastly, the commitment to Usefulness is seen in widening knowledge about the role of AI in creative processes and also laying a foundation for future research thus improving the state of knowledge in the emerging field.

3.3. PARTICIPANT SELECTION

This investigation conducted twelve interviews with a diverse group of advertising professionals. These professionals were selected based on their varying levels of experience, job roles within their respective agencies, and age groups. This diverse selection criteria ensured a comprehensive understanding of the subject matter from multiple perspectives. It was carefully chosen by a mix of individuals including creative directors, copywriters, account managers, project managers, and strategists to capture varied insights based on their specific functions within the advertising agencies. Additionally, it included participants ranging from industry veterans to mid-career professionals and newcomers to ensure a comprehensive perspective across different career stages. This diverse selection aimed to gather a broad spectrum of experiences

and viewpoints, offering a nuanced understanding of how different professionals perceive and utilize ChatGPT in the Design Thinking process.

3.4. COMPANY SELECTION

The three advertising agencies invited and involved in this study were chosen based on their popularity and well-known status within the industry. This selection guarantees that the findings will be relevant and applicable across the advertising spectrum, encompassing agencies that are innovating at the forefront of AI integration and those that are just beginning to explore such technologies.

3.5. INVESTIGATION'S OUTPUT

The primary focus of the investigation was to identify emerging patterns and differences in how the interviewees described the integration of ChatGPT in the DT process. This objective aligns with the exploratory nature of our study, allowing us to gain in-depth insights into a relatively new area of application within the advertising industry for future research.

4. EMPIRICAL STUDY

4.1. STUDY DESIGN

4.1.1. Research Objectives

The primary objective of this thesis is to conduct an exploratory and analytical investigation into the integration of ChatGPT within the Design Thinking framework utilized by advertising agencies. This exploration aims to understand the influence of ChatGPT on the creative problem-solving processes within these agencies, as well as identify potential benefits and challenges arising from the integration of ChatGPT into the Design Thinking process. And also proposes a revised framework for the Design Thinking process that incorporates ChatGPT as an output to implement in advertising agencies.

4.1.2. Premises

Based on the initial understanding of the subject and the defined research question, the study posits the following premises:

- P1 - ChatGPT acts as an allied tool in the creative and problem-solving process, aiding in the generation of ideas and solutions.
- P2 - The incorporation of ChatGPT into the creative process enhances the workflow's dynamism and efficiency within advertising agencies.

These premises will be explored through qualitative analysis of experiences and perceptions of advertising professionals regarding their use of ChatGPT in the Design Thinking process.

4.2. SAMPLING METHOD

4.2.1. Intentional and Stratified Sampling

The study employs an intentional sampling strategy (Thomas, 2023; Turner, 2003), specifically targeting individuals within the advertising industry who are acquainted with both ChatGPT and creative or management processes. This focused approach ensures that participants are well-positioned to provide informed and relevant insights into the practical integration of AI tools like ChatGPT in their workflows.

To mitigate potential biases that often accompany intentional sampling, the research incorporates stratified sampling techniques. This methodological choice aims to ensure a diverse representation across different agency departments and levels of experience. By doing so, the study captures a breadth of perspectives, from strategic management to hands-on creative execution, offering a comprehensive understanding of ChatGPT's role in various facets of the advertising industry.



Figure 4 - Stratified Sampling by Scribbr (Thomas, 2023)

After defining the target population of this study - people working in the advertising industry, they were divided and organized by agencies operating in Portugal, namely in Lisbon. After defining the population, it was necessary to find out which jobs in an agency potentially use tools such as ChatGPT. As such, the population was divided into account managers, designers/art-directors and copywriters. Other positions of great interest encourage diversity of response: creative directors and strategists.

Another important point in stratifying the sample was to consider agencies operating in Portugal, taking into account factors that always enhance diversity and rich insights. In this way, three agencies with different profiles were considered. In this way, two arguments were taken into account:

1. Representative diversity: The agencies selected - two national and one multinational, based in Lisbon - collectively represent a diverse cross-section of the advertising scene in Portugal. This diversity is reflected in their size, scope and main focus, which ranges from traditional advertising to digital performance.
2. Feasibility and Opportunity for depth insights: Working with a smaller, more specific group of agencies allows for a more in-depth analysis of each organization's unique experiences and practices. This depth is crucial in a qualitative study, where the richness of the data often exceeds the need for a large sample size.

4.2.2. Participant Sample

This selection ensures a varied and comprehensive exploration of viewpoints, capturing how different roles within each agency perceive and utilize ChatGPT in the Design Thinking process. The number of participants from each agency was determined based on the size and complexity of the agency, ensuring a representative sampling from each organizational structure.

Table 1- Interview's Sample

Agency ID	Dimension	Business Core	Job Roles
AGEN1	48 employees	Advertising	2 Account managers 1 Designer 1 Copywriter 1 Creative Director
AGEN2	41 employees	Advertising and digital performance	1 Account manager 1 Designer 1 Copywriter 1 Creative Director
AGEN3	27 employees	Advertising and events production	1 Account Manager 1 Designer 1 Copywriter

4.3. DATA COLLECTION

4.3.1. Initial Contact and Invitation Process

The data collection process commenced with initial contact with potential participants via mobile phone between November 30 and December 8, 2023. This step involved inviting advertising professionals from the selected agencies and obtaining their email addresses for further communication. The purpose of this initial contact was not only to extend the invitation but also to introduce the research and establish a preliminary rapport.

Following the phone calls, formal email invitations were sent out from December 8 2023 to January 8 2024. These emails included a direct link to a questionnaire hosted on the NOVA IMS Qualtrics platform. This approach was chosen to provide participants with the flexibility to respond at their convenience, ensuring thoughtful and in-depth answers. The timeframe allowed for ample response time, ensuring participants could engage with the questions without feeling rushed.

4.3.2. Benefits and Limitations of Email-Based Data Collection

The data collection method of email interviews used in this study has inherent limitations and advantages. Although Internet access and the need for digital literacy are mandatory, this factor did not influence the study given the target chosen for it. However, the absence of non-verbal clues and the human conduct of the interview presented challenges in building relationships, interpreting accurately, and maintaining a dynamic dialog, and also increased the risk of bias due to the potential exclusion of participants. On the other hand, the method facilitated the disclosure of sensitive information due to the privacy it provided, allowed for a more in-depth exploration of topics with the opportunity for participants to give nuanced and thoughtful responses when it suited them and proved effective in engaging diverse populations, particularly those that may be more difficult to reach through traditional interview methods.

4.3.3. Interview Questions

The focal point of this thesis is a set of unstructured interview questions (Qu & Dumay, 2011), conceived to uncover the intricacies of integrating ChatGPT into the Design Thinking framework at advertising agencies. These questions are the conduits through which we seek to understand, analyze, and ultimately refine the creative problem-solving process that is important to the advertising industry. The questions are structured around key themes that align with the study's primary objectives to assess the influence of ChatGPT on creative problem-solving, to identify the potential benefits and challenges of its integration, and to propose enhancements to the existing Design Thinking framework.

Table 2 - Interview Questions

Objectives	Questions
ChatGPT integration on the professional's workflow.	Can you describe how you have integrated ChatGPT into your professional workflow? When do you find it most beneficial?
Potential ChatGPT integration in the Design Thinking Process.	In what stages of Design Thinking do you envision integrating ChatGPT specifically? What potential benefits do you foresee from incorporating ChatGPT into Design Thinking?
Identify challenges and limitations of ChatGPT	What challenges or limitations do you anticipate might arise from integrating ChatGPT into Design Thinking?
Impact of ChatGPT on Creativity and Problem Solving	In what ways do you think ChatGPT can enhance creativity and problem-solving within Design Thinking?

4.4. DATA ANALYSIS

The Total Quality Framework (Roller & Lavrakas, 2015) provides a comprehensive approach to qualitative research that emphasizes quality and integrity throughout the research process and this framework is particularly pertinent to this thesis, which seeks to explore the nuanced dynamics of ChatGPT's role in the Design Thinking process within the advertising industry. As mentioned before, TQF's emphasis on Credibility,

Analyzability, Transparency, and Usefulness also serves as cornerstones for conducting a rigorous qualitative analysis.

4.4.1. Qualitative Content Analysis with TQF

Qualitative content analysis under the TQF involves a systematic coding and categorizing approach to make sense of large amounts of textual data and it enables one to sift through the data with a lens focused on discerning meaningful patterns, themes, and insights.

The empirical data, collected from interviews with professionals across Portuguese advertising agencies, will be subjected to this systematic method. Using a tailored code form developed following TQF principles (Roller & Lavrakas, 2015) and the data content, the interviews were coded, categorizing the content into themes that reflect the experiences and perceptions regarding ChatGPT's integration. This method will enable us to capture a broad spectrum of impacts, from enhancing creativity to identifying potential barriers to effective implementation and leading to a new and reframed DT framework.

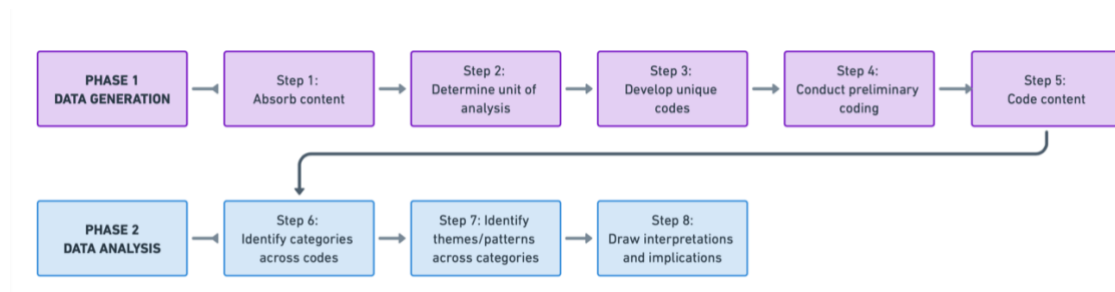


Figure 5 – Phases in qualitative content analysis in TQF (Roller & Lavrakas, 2015)

The empirical data, derived from interviews was systematically analyzed using the 8 basic steps of qualitative content analysis as outlined by the TQF. These steps are organized into two main phases: Data Generation and Data Analysis, as described in the following topics.

Also aligned with TQF's suggestion (Roller & Lavrakas, 2015) ATLAS.ti, a robust software tool for qualitative data analysis, was utilized in the coding of the interview, and organizing for a more efficient analysis. This coding facilitated the categorization of

content into themes reflecting the experiences and perceptions regarding ChatGPT's integration. The use of ATLAS.ti bolstered the methodological rigor, providing a means for reliably managing the data in line with TQF principles of Credibility, Analyzability, Transparency, and Usefulness.

4.4.2. Coding process

The methodology employed for data analysis is grounded in a qualitative framework, focusing on the systematic interpretation of textual data. Initially, deductive coding was made where initial codes were formulated based on pre-existing insights from the Literature Review chapter, combining that method with an inductive coding approach to sift through the interview transcripts, allowing patterns and categories to emerge naturally from the data. This approach facilitated the identification of recurring concepts and insights related to the integration of ChatGPT in advertising agencies and the different job roles. Following the initial coding, a rigorous process of review was undertaken to refine and validate the codes, ensuring they accurately reflected the interviewees' thoughts and the research objectives. To ensure reliability, codes were constantly compared against the data, enabling the consolidation of related codes into coherent categories. This structured organization of codes into groups facilitated the identification of overarching themes, painting a comprehensive picture of ChatGPT's impact on the creative workflows and the Design Thinking process framework.

- **Initial Coding**

The coding process began with an immersive review of the interview transcripts to familiarize with the data and review the research question as well as the literature review that was made (Step 1 – Absorb content). Subsequently, the unit of analysis was determined (Step 2 – Determine unit of analysis), which in this study, were the individual responses and quotes from the interview transcripts. This established a clear focal point for the analysis and set the parameters for what would be considered a meaningful unit for coding. Once the unit of analysis was established, initial codes were created deductively, in a first approach, based on LR and inductively, rooted in the respondents' language and experiences (Step 3 – Develop unique codes). The first set of unique deductive codes provided an initial scaffold for

the analysis, ensuring alignment with the research objectives and the literature. In the initial set, a set of codes was considered, aligned with some information taken from the LR, related to some benefits and implications of using ChatGPT, such as "Biased information" (Kasneci et al., 2023), "Data insecurity" and "Power of synthesizing information" (Bahrini et al., 2023), "Brainstorming tool" (Fattepure, 2023) and "Efficient writing" (Aydın & Karaarslan, 2023). However, to encapsulate the richness of the data and the nuanced perspectives of interviewees, an inductive approach was adopted to refine and expand these codes. This iterative process, rooted in the respondents' language and experiences, enriched the analysis, ensuring the emergence of patterns and categories directly from the data itself. It facilitated the identification of novel insights and interpretations, enhancing the depth and breadth of the analytical findings, in alignment with TQF principles (Roller & Lavrakas, 2015). This dynamic interplay between deductive reasoning and inductive discovery upheld the credibility of the study by fostering a robust, evidence-based understanding of ChatGPT's integration into advertising agencies and its influence on various job roles, as displayed in Appendix B - Codebook.

- Code Review and Refinement

A preliminary coding and systematic review of these initial codes was conducted to refine them, ensuring their alignment with the data's nuances and complexities (Step 4 - Conduct preliminary coding). This iterative process involved constant comparison between codes, merging similar codes, and splitting broader codes into more precise categories. The reliability of the coding process was enhanced through constant evaluation of codes where they were contested and revised.

- Codes

The culmination of Phase 1 was the systematic coding of content (Step 5 – Code Content), which involved meticulously labeling each relevant excerpt from the interviews. This step was essential for organizing the data into manageable segments for further analysis. The coding at this stage remained close to the data, with a focus on staying true to the participants' voices and the contextual richness of their responses. This coding and categorization work culminated in the final

Codebook presented in Appendix B - Codebook, with a total of 5 categories and 40 codes.

4.4.3. CATEGORIZATION PROCESS

Moving into Phase 2, data analysis, the next crucial step was to identify categories across codes. This step marked the transition from coding to categorization, where similar codes were grouped to form coherent categories (Step 6 – Identify categories across codes). The categories were conceptualized to reflect broader patterns in the data, going beyond mere aggregation to interpret the significance of the codes within the context of the research questions. This stage was marked by an iterative process, where categories were constantly refined and redefined as the analysis progressed. The goal was not simply to organize the data but to begin synthesizing it into meaningful clusters that would facilitate a deeper understanding of the themes and patterns emerging from the interviews, analyzed in the next chapter Results and Discuss.

This organization was guided by the patterns that emerged from the data, reflecting broader themes or concepts relevant to the research questions. The grouping process was iterative, with categories being refined, merged, or divided as deeper analysis revealed more about the relationships between codes. This phase was critical for moving beyond descriptive coding to analytical coding, where the data began to inform the research findings more substantively. The use of visual mapping tools facilitated this process, enabling a holistic view of how codes interconnected and formed broader thematic categories.

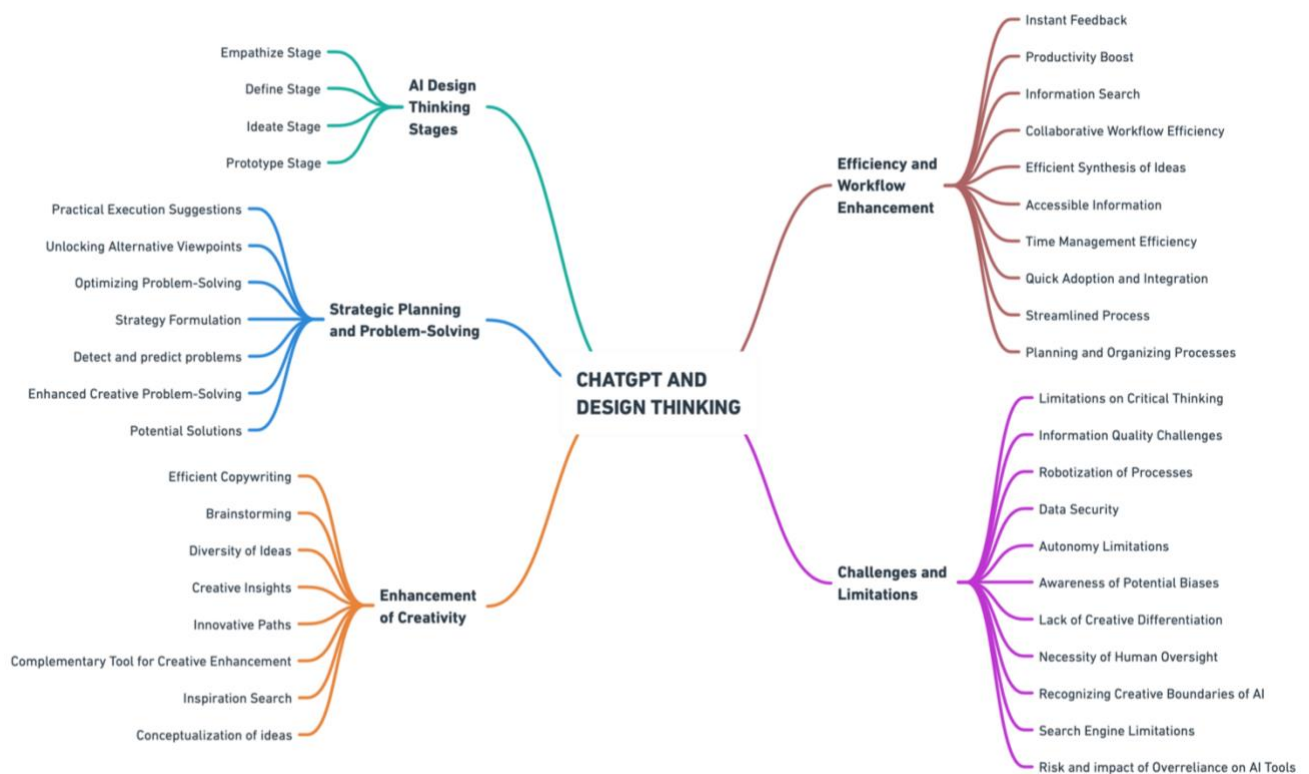


Figure 6 - Categorization of codes

4.4.4. LIMITATIONS OF THE DATA ANALYSIS PROCESS

When analyzing the interview data through a qualitative content analysis, this research recognized the limitations inherent in this methodology, as the Total Quality Framework (Roller & Lavrakas, 2015) mentioned. Firstly, the process of interpreting textual material presents significant challenges, namely avoiding misinterpreting causal relationships and constructing narratives that are not fully substantiated by the data. This analysis was conducted with a critical eye toward these pitfalls, emphasizing thematic identification without presuming causality to mitigate the risk of over-interpretation. Furthermore, the TQF highlights the potential distortions introduced by the inherent biases and perceptions of interview participants.

This study has been mindful of these factors, striving to present a balanced view that encapsulates both individual experiences and broader insights into the creative industry. The dynamic nature of participants' responses and the variability in their perspectives, informed by both personal and collective experiences, were considered to discern

patterns that reflect a collective experience while acknowledging the unique context each participant contributes.

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5. RESULTS AND DISCUSSION

5.1. OVERVIEW

This chapter aims to elucidate the findings of the empirical study conducted on the integration of ChatGPT within the Design Thinking process in advertising agencies. Given the exploratory and qualitative nature of this research, the chapter is structured to provide a comprehensive analysis of the data collected from interviews with professionals in the advertising sector. This investigation was driven by two primary objectives: firstly, to understand how ChatGPT is being integrated into creative workflows and problem-solving processes within these agencies; and secondly, to assess the impact of such integration on the efficiency and dynamism of the Design Thinking framework.

Building on the theoretical foundation laid in the literature review, this chapter is organized to systematically address the premises highlighted before:

- P1 - ChatGPT acts as an allied tool in the creative and problem-solving process, aiding in the generation of ideas and solutions.
- P2 - The incorporation of ChatGPT into the creative process enhances the workflow's dynamism and efficiency within advertising agencies.

The subsequent topics are dedicated to presenting the findings related to key themes that emerged from the data analysis (TQF Step 7 – Identify themes/patterns across categories). These themes include the integration of ChatGPT into professional workflows, its perceived benefits and challenges, and its overall impact on problem-solving creativity.

This chapter not only aims to present these findings but also to discuss them to contribute to the ongoing discourse on the intersection of technology and creativity, offering new perspectives on the integration of generative AI tools like ChatGPT in creative processes (TQF Step 8 - Draw interpretations and implications).

5.2. RESULTS

5.2.1. Enhancement of Creative and Problem-Solving

The ChatGPT enhances both creative processes and strategic planning capabilities and it includes leveraging AI for efficient copywriting, generating ideas, and providing strategic insights.

Keywords: Efficient copywriting, creative insights, strategic planning, innovative paths, brainstorming, conceptualization of ideas.

Examples: "...important assistant when it comes to building ideas that are creative but strategically functional"; "... é um meio rápido e eficaz de produzir mensagens..."; "...processo de brainstorming ele é muitas vezes mais prático para encontrar insights."

- Sub-theme: Creativity increase

This sub-theme focuses on enhancing the creative process through efficient copywriting for creativity and explanation, conceptualizing ideas, and providing diverse insights. It illustrates how ChatGPT serves as a tool for creative enhancement, offering diverse ideas and inspiration.

Examples: "... ferramenta de apoio à pesquisa de insights..."; "...processo de brainstorming ele é muitas vezes mais prático para encontrar insights..."; "... ferramenta pode dinamizar o processo criativo e ajudar a explorar ideias...".

- Sub-theme: Problem-solving driven

This sub-theme describes how ChatGPT aids in strategic planning and problem-solving and it shows how ChatGPT optimizes problem-solving processes, unlocks alternative viewpoints, and suggests practical execution strategies, thereby enhancing creative problem-solving capabilities.

Examples: "... it also might be useful for seeking feedback and alternative ideas."; "...quando estou presa num raciocínio e preciso de novas hipóteses ou pontos de vista."; "... desbloqueio da criatividade".

5.2.2. Workflow Optimization

This theme explores the role of ChatGPT in streamlining operations and enhancing workflow efficiency. It focuses on how AI tools can improve planning, organizing, and executing work processes but does not dive into the creative aspects of AI applications. Keywords or Phrases: Workflow efficiency, process optimization, time management, quick adoption, collaborative workflow.

Examples: “I’ve integrated ChatGPT as a collaborative tool in my professional workflow, shaping my thinking approach.”; “ChatGPT is the most useful tool for stages like planning, structuring, and organizing processes and information.”; “A discreet integration ensures a more streamlined process, offering valuable input without overshadowing the creative brief writing...”

- Sub-theme: Time-saving

Highlights the benefits of enhancing time management and it fits into Theme 2 by specifically demonstrating how ChatGPT facilitates operations by effectively reducing time in some processes.

Examples: “... pode ajudar a encurtar certas partes do processo...”; “... economiza o nosso tempo...”; “... consigo filtrar rapidamente ganhando tempo...”; “... offers considerable time-saving benefits.”

- Sub-theme: Information search and feedback

This sub-theme emphasizes the importance of using ChatGPT for instant feedback, and information retrieval, and how it boosts productivity.

Examples: “... ferramenta de apoio à pesquisa de insights e informação...”; “... sistematização e pesquisa de informações, referências e publicações sobre determinado assunto...”; “... feedback imediato sobre as ideias apresentadas...”; “... providing feedback on our ideas and finding some solutions to our problems.”

5.2.3. Challenges and Limitations of AI Integration

This theme focuses on the limitations and challenges associated with integrating GenAI tools like ChatGPT, focusing on creative, operational, and ethical concerns.

Keywords or Phrases: Creative boundaries and limitations, the need for human oversight, data security, operational risks, ethical concerns.

Examples: “A nível de motor de busca, para responder a determinadas questões, acaba por ser limitado...”; “... biased information...”; “Não acho que seja melhor na sugestão de ideias criativas...”; “... a criatividade e a inovação vão precisar sempre do cunho humano.”.

- Sub-theme: Creative and Critical Thinking Limitations

This sub-theme deals with the limitations of AI in fostering creative and critical thinking, highlighting the need for human oversight and recognizing the autonomy limitations of AI. It aligns with Theme 3 by outlining concerns over this AI tool’s impact on creative differentiation and critical thinking abilities.

Examples: “Falando diretamente em criatividade, é contudo uma ferramenta limitada, uma vez que ainda se baseia apenas em texto.”; “A versão gratuita do ChatGPT, de certo modo, não é uma ferramenta de criatividade não acho que tenha o potencial para cumprir, autonomamente, o processo completo.”; “... penso que não é igualmente útil para todas as tarefas criativas, depende da complexidade do pedido ou do tema...”; “... great need for human thought to accompany the information so that it doesn't become strange or random.”; “...uso frequente pode ter um impacto negativo no desenvolvimento da capacidade criativa pessoal...”

- Sub-theme: Bias and Ethical Concerns

Data security and bias information issues, the risk of overreliance on AI, and the potential for process robotization are the main keywords of this sub-theme and it fits within theme 3 by discussing the operational efficiencies and ethical dilemmas set by integrating AI tools into workflows.

Examples: “... information breaches (related with data security and rgpd)”;

“Robotização de processos...”; “Se o assumirmos como um primeiro passo em qualquer fase criativa estamos a privar o nosso cérebro de fazer esse processo, o que pode levar à habituação e a um consequente "atraso" no desenvolvimento da habilidade criativa.”; “... o facto de o modelo de "machine learning" se basear em datasets predefinidos acaba por criar um "bias" que irá viciar sempre os resultados...”.

5.2.4. Integrating ChatGPT into Design Thinking Stages

The integration of ChatGPT across the stages of the Design Thinking process, highlights how AI can contribute to a deeper understanding of users' environment, a clearer definition of project goals, an enhanced ideation process, and support in prototype development. It focuses specifically on the application of AI within the framework of Design Thinking. In this data set, none of the participants considered the Test phase as a potential for integrating the ChatGPT tool, which is why it was not considered in these results.

Keywords or Phrases: Empathize stage, Define stage, Ideate stage, Prototype stage, user understanding, project goals.

Examples: "... start and go into more in-depth research..."; "Empathize and Define stages."; "In the empathize and define stages."; "Mas a integração do ChatGPT no processo pode revelar-se incrivelmente útil das fases 2 – 4...".

- Sub-theme: Design Thinking Process Enhancement

ChatGPT can be utilized across the Empathize, Define, Ideate, and Prototype stages of the Design Thinking process. It showcases the tool's potential to enhance 4 out of 5 steps of the Design Thinking process, from gaining empathetic insights into users' needs to assisting in the rapid development and evaluation of prototypes. ChatGPT's role in this process is to facilitate deeper insights, foster creative ideation, and streamline the prototyping process, thereby enhancing the overall effectiveness and efficiency of Design Thinking.

Examples: "In the "Prototype" stage as well - in strategy planning. A discreet integration ensures a more streamlined process, offering valuable input without overshadowing the creative brief writing and strategic planning aspects of my role."; "... útil na fase de criar ideias..."; "Na fase inicial de pesquisa, recolha de informação"; "o ChatGPT é bastante eficiente para a materialização de textos explicativos em determinados projectos"; "... start and go into more in-depth research...".

5.3. DISCUSSION

By addressing the dynamics between artificial intelligence and creative processes in advertising agencies, this research aimed to clarify the perception of ChatGPT as a tool in the creative agency industry and thus propose a natural integration of ChatGPT into the Design Thinking framework. Through a meticulously designed qualitative methodology that also encompasses qualitative analysis, this study attempted to highlight real insights and conclusions about the perception of this topic among professionals in the respective field. The overall aim was not only to explore how ChatGPT could improve creativity and problem-solving, but also to identify the current limitations and challenges in its use. This chapter seeks to dissect the implications of the results, culminating in a final product that will be the updated DT framework with the possible integration of ChatGPT. In this chapter, we will navigate through the synthesized ideas, critically analyzing their alignment and restructuring what is the conceptual framework of Design Thinking.

5.3.1. Overview of Key Findings

The research conducted into the use of ChatGPT in the workflows of advertising professionals, as well as its integration into the Design Thinking framework, revealed valuable insights into how this tool is making its mark on the landscape of advertising agencies. The data suggests that ChatGPT is being incorporated significantly in the ideation and conceptual development phases, offering a vast, robust and rapid availability of information that allows for an improvement in the creative and problem-solving process. The analysis also identifies a sense of remarkable improvement in the efficiency of workflow processes, attributed to ChatGPT's ability to quickly generate diverse ideas, possible solutions and instant feedback. Key themes emerging from the data include the transformative potential of ChatGPT in fostering a culture of collaboration and experimentation between AI and human thinking, along with the critical need to address ethical considerations and the development of guidelines for its effective integration.

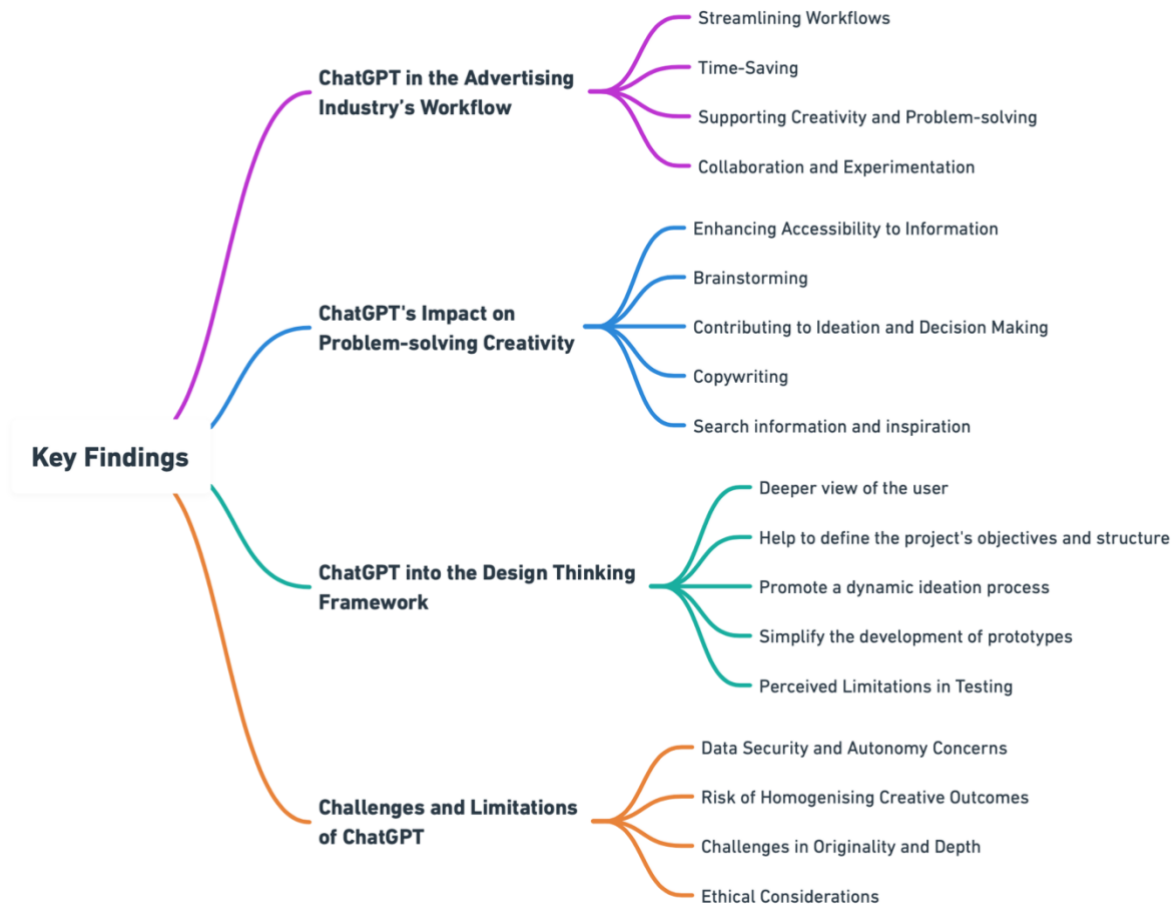


Figure 7 - Research Key Findings

5.3.2. The integration of ChatGPT in the advertising industry's workflows

The integration of ChatGPT into professional workflows has been shown to streamline processes, improve the information search, and save time on filtering information. This efficiency allows creative professionals to devote more time to creative activities that depend almost entirely on the human mind. This reinforces the value of ChatGPT in facilitating a more dynamic and efficient workflow, which can be critical in fast-paced advertising environments. This conclusion supports Premise 1 (P1) and Premise 2 (P2), indicating that ChatGPT is indeed a valuable ally in the creative and problem-solving processes that enhance the advertising agency's workflows. These various applications of ChatGPT, in this particular study, underline and highlight its versatility and its

potential to improve traditional workflows, aligning with findings from “Is ChatGPT Leading Generative AI? What is Beyond Expectations?” (Aydın & Karaarslan, 2023) and “ChatGPT: Applications, Opportunities, and Threats” (Bahrini et al., 2023) articles, who highlight ChatGPT's role in driving innovation and efficiency.

5.3.3. The impact of ChatGPT specifically on problem-solving creativity

ChatGPT's role in the creative problem-solving process emerges as a key theme, with the tool enhancing accessibility to vast information and offering alternative solutions and points of view in one or more situations. The study also suggests that ChatGPT can be a valuable asset supporting the ideation phase, contributing to more informed decision-making and problem-solving approaches. This capability of providing insights, potential solutions, and a broad perspective on creative challenges helps to make the brainstorming and ideation process more organized and structured. Also, ChatGPT significantly aids, as a complementary tool, in the conceptualization of ideas and efficient copywriting, serving as a dynamic tool for generating creative content. This aligns with previous studies highlighting AI's potential to augment human productivity by providing diverse perspectives and rapid ideation capabilities (Lee et al., 2018).

However, while ChatGPT enhances certain aspects of creative work, such as expediting research and generating initial ideas, it also introduces challenges in ensuring originality and depth in creative outputs. This dichotomy reflects the broader debate on the role of AI in creative industries, suggesting that while AI can augment human creativity, it cannot replace the nuanced understanding and emotional depth that human creatives bring to their work (Haleem et al., 2022).

5.3.4. The Integration of ChatGPT into the Design Thinking Framework

The integration of ChatGPT into the Design Thinking process, as highlighted by the findings, opened a rich vein of discussion in this thesis, particularly in how AI can revolutionize creative processes across several stages—Empathize, Define, Ideate, and Prototype—except for the Test phase, where its integration was notably absent

according to participant feedback. This aligns with works that advocate for the integration of digital tools to enhance the creativity and efficiency of the Design Thinking process (Beckman, 2020).

This absence offers a poignant starting point for a discussion about the perceived limitations or challenges of this type of GenAI for the Test phase in Design Thinking. Although it was mentioned by some participants that ChatGPT provides quick feedback on content inserted into the platform, there was no consideration of integrating ChatGPT into this phase of the process. This may be because the process of evaluating and providing feedback on creative processes requires a lot of human empathy and understanding. This gap in the application of AI highlights a critical area for future exploration, to bridge the gap between the capabilities of AI and the nuanced demands of user testing.

In addition, the findings highlight the role of ChatGPT in improving the DT process, marking a change in the way creative problem-solving can be approached. By facilitating a deeper view of the user, helping to define the project's objectives and structure, promoting a more dynamic ideation process and simplifying the development of prototypes, ChatGPT emerges as a transformative and facilitating tool.

However, the selective application in the Design Thinking phases invites a broader reflection on the role of AI in creative workflows. It suggests that while AI can significantly leverage human creative capabilities, its integration should be strategically aligned with the phases where its impact is most beneficial and where human oversight can effectively complement AI's data-driven insights.

Some of the practical implications of integrating ChatGPT - evidenced by participants' experiences in improving brainstorming sessions, accelerating initial research, and refining prototypes - point to a nuanced understanding of AI's potential not only to automate but also to profoundly enrich creative processes. This practical integration of ChatGPT into advertising agencies not only increases efficiency, but also offers new perspectives and solutions that may not be quickly and immediately visible through

traditional methodologies. These findings resonate with the perspectives shared by participants, who highlighted ChatGPT's role in unlocking creative pathways, increasing ideational diversity, and streamlining the explication of complex concepts.

This discussion naturally leads to the strategic integration of ChatGPT within the Design Thinking framework, highlighting the importance of a balanced approach where AI supports human creativity without overshadowing the essential intuitive and empathetic aspects of design. It also points toward the evolving landscape of AI in creative industries, where tools like ChatGPT are not just facilitators of efficiency but also partners in creative exploration, where the pressure to innovate is constant.

5.3.5. The Challenges of ChatGPT in the Design Thinking Process

Despite the benefits observed, this study also highlights challenges and limitations associated with integrating ChatGPT into Design Thinking.

Despite the benefits, it also sheds light on the challenges and limitations associated with integrating ChatGPT into Design Thinking. Concerns about data security, the potential to reduce autonomy and critical thinking, and the risk of homogenizing creative outcomes highlight the need for human oversight and the importance of balancing AI contributions with human creativity and intuition. These conclusions reflect the concerns in the literature to ensure that AI tools, such as ChatGPT, complement and do not compromise the human element in creative processes.

5.4. AI-DRIVEN DESIGN THINKING FRAMEWORK

5.4.1. Introduction to AI-Driven Design Thinking Framework

In the rapidly evolving landscape of the advertising industry, the integration of artificial intelligence tools such as ChatGPT represents a significant leap forward in the way creative processes are approached, managed and optimized. Traditional Design Thinking frameworks have provided a robust structure for understanding user needs, designing solutions, creating prototypes and testing the results. However, as digital technologies

advance, a marked gap emerges in these traditional methodologies - a gap that does not include the powerful capabilities of AI to transform and elevate the creative process. This research identifies and aims to fill this gap by proposing a revised Design Thinking framework that incorporates ChatGPT, marking a breakthrough in the field of design and creative problem-solving.

The creation of this AI-driven design thinking framework is not just an academic exercise, but a strategic response to the needs of the contemporary advertising industry, specifically in the agency where this need arose. It is driven by the personal ambition and professional need to harness the potential of AI to significantly improve creativity, increase efficiency and simplify everyday problem-solving processes at the agency. Integrating ChatGPT into the Design Thinking process opens up new avenues for advertising professionals to access a deeper understanding of user environments, articulate clearer project objectives, participate in more enriched ideation sessions, and support the dynamic development of prototypes. However, the notable absence of ChatGPT in the testing phase of existing models highlights an area ripe for innovation, suggesting that even as AI transforms creative workflows, there remains uncharted territory in fully harnessing AI for comprehensive user testing and feedback analysis.

This new framework is designed to empower advertising agencies not only to keep pace with the digital transformation, but also to lead it by adopting a more up-to-date and inclusive AI approach to creativity and project management. It promises to equip professionals with the tools and methodologies needed to more effectively navigate the complexities of modern advertising and project management challenges, promoting solutions that are not only innovative but also deeply aligned with user needs and expectations. Through this AI-driven approach, the framework aspires to set a new standard for how design thinking can be expanded and enriched in the digital age.

5.4.2. The foundation of the AI-Driven Design Thinking Framework

The integration of ChatGPT into the Design Thinking phases of Empathy, Definition, Ideation and Prototyping - while notably excluding the Testing phase - represents a differentiated understanding of the role of AI in creative problem-solving. This structure aims to strategically harness ChatGPT to increase creativity and efficiency, reflecting on insights from participant feedback and the wider implications for AI in design. At the same time, integration of key themes such as Human-AI Collaboration, Flexibility and Adaptability, and Responsible Use of AI into an AI Inclusive Design Thinking Framework involves embedding these principles deep into each phase of the Design Thinking process. This integration creates a comprehensive framework that not only takes advantage of ChatGPT's capabilities but also does so in a way that aligns with human creativity, specific project needs, and more ethical considerations.

Table 3 - AI-Driven Design Thinking Framework Stages

Stages	Objectives	Applications
Search	Gain a deeper understanding of user needs and experiences through AI.	Reveal underlying user sentiments, needs, and pain points. AI-driven analytics tools can also track trends and patterns, providing a dynamic view of user behaviors and preferences. The Search phase can be enhanced by AI's ability to sift through and make sense of extensive datasets that would be unmanageable for humans alone, leading to a more insightful and data-driven understanding of the target audience.
Synthesize	Synthesize insights to articulate a clear, concise problem statement with AI's help.	Synthesis of complex data into actionable insights by identifying common themes, contradictions, and gaps in the information collected during the Search phase. Tools like text summarization can help condense large volumes of qualitative data into manageable summaries that highlight key insights.
Ideate	Enhance creative ideation with AI-generated ideas, ensuring a diverse range of solutions.	Generate a wide range of ideas and solutions based on the data inputs the AI tool has received. In this stage can create new scenarios, or alternative perspectives that challenge conventional thinking and creativity. By feeding AI systems with the problem statement and relevant data, teams can use AI as a brainstorming partner that offers suggestions beyond human

		cognitive biases and experience limitations, ensuring a broader exploration of potential solutions.
Tuning	Streamline the prototyping process with AI-generated materials and tune the prototypes of the generated ideas.	AI-driven tools can quickly generate prototype variations based on specified parameters, allowing users to explore multiple iterations accelerating the prototyping stage. Generative design software can propose optimal shapes, materials, and configurations based on functional requirements and constraints. Additionally, AI can simulate user interactions with prototypes, providing preliminary feedback, thus tuning the prototypes more efficiently for user trials.
Test	Explore AI's potential to structure and analyze qualitative feedback, recognizing its current limitations in capturing the nuanced demands of user testing.	While AI's capability to fully understand and evaluate human emotions and nuanced feedback is limited, it can still play a supportive role in structuring and analyzing qualitative data collected during user tests. AI tools can categorize feedback into themes, track sentiment over different prototype iterations, and identify patterns in user responses that might indicate areas for improvement. The use of AI in this phase should be complemented by human analysis to interpret the subtleties and complexities of user feedback.

5.4.2.1. Framework Adaptability

The flexibility and adaptability of the framework allow it to be customized to fit a wide array of project scopes, creative challenges, and industry requirements. This adaptability means that teams can scale the integration of AI tools like ChatGPT ensuring that the technology serves the project's unique needs without overshadowing the human elements of creativity.

5.4.2.2. Responsible AI Use

The responsible AI use within the framework addresses the critical need for ethical considerations in AI integration, including user privacy, bias mitigation, and inclusivity (Bahrini et al., 2023). This includes employing AI in ways that respect user data and actively seeking to identify and reduce biases in AI-generated insights. Furthermore, the data privacy policy is a very important issue in the business sector, as data protection and confidentiality must be guaranteed whenever required in the interaction processes

with the AI tool. Thus, we guarantee that a conscious and responsible approach to the use and integration of this tool is taken.

AI-Driven Design Thinking Framework

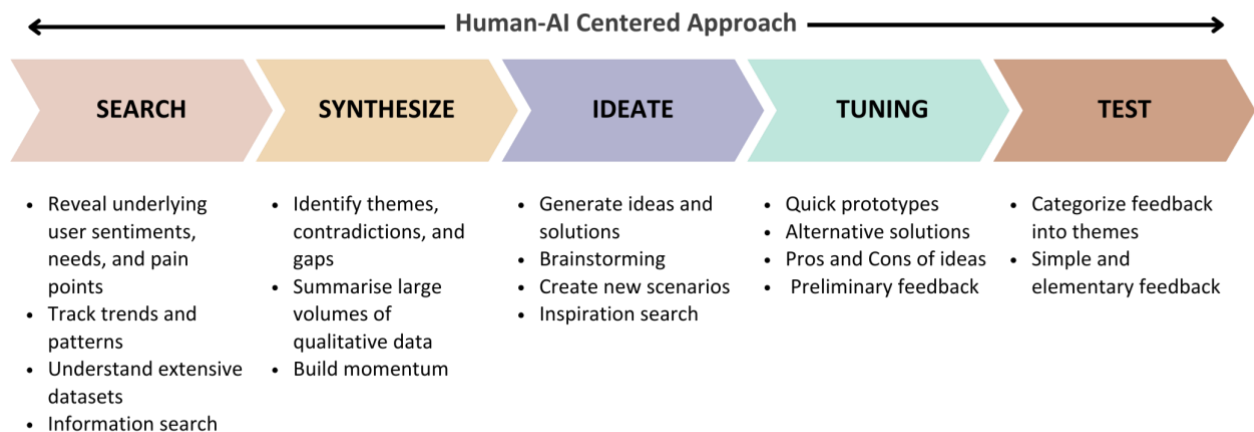


Figure 8 - AI-Driven Design Thinking Framework

5.4.3. Framework Limitations

While the AI-Driven Design Thinking Framework represents a significant stride toward integrating advanced AI capabilities into creative processes, it's important to acknowledge and critically examine its limitations. And one of the primary limitations is that the framework has not been empirically tested. Its effectiveness and impact are, therefore, speculative at this stage, based on theoretical integration and anticipated outcomes. The absence of real-world testing means that the practical challenges of implementing the framework, especially in diverse and dynamic creative environments, remain unexplored. Future iterations of the framework will benefit greatly from pilot studies and case analyses that provide empirical data. Another significant concern is the inherent limitations and biases within ChatGPT itself considering that is susceptible to biases present in its training data. These biases can lead to inaccuracies in information, potentially skewing user insights, problem definitions, and ideation processes.

Recognizing and mitigating these biases is crucial, especially in the Empathize and Define stages, where understanding user needs and challenges is paramount.

Furthermore, the most advanced and complete versions of ChatGPT are not freely accessible, presenting cost barriers that may limit the widespread adoption of the framework, especially among smaller agencies or individual practitioners. This limitation restricts the democratization of advanced ChatGPT tools and updates within the creative industry, potentially creating disparities in who can leverage these technologies to enhance their design thinking processes.

6. CONCLUSIONS AND FUTURE WORKS

The integration of ChatGPT into the Design Thinking process symbolizes a digital evolution in advertising agencies, presenting a mix of opportunities and challenges in the process of creativity and problem-solving. It provokes a re-evaluation of traditional creative methodologies, promoting a collaborative synergy between human ingenuity and artificial intelligence. This partnership promises to simplify workflows and catalyze innovative creative results, depending on whether agencies skillfully manage the balance between creativity and the influence of AI. However, a gap was identified in the study in the use of ChatGPT during the Design Thinking test phase. This gap underlines a broader discussion about the limitations and challenges of applying generative AI in areas that require deep human empathy and differentiated typical human understanding. The absence of insights and consideration from the study participants about the integration of ChatGPT here signals a crucial avenue for future research, to develop AI-assisted testing methodologies. These methodologies could potentially bridge the current divide by simulating user interactions, analyzing feedback at scale and discovering patterns in user responses.

The journey to integrate GenAI into Design Thinking doesn't end with recognizing its benefits and limitations. Instead, it marks the beginning of an ongoing iterative process that encourages collaboration, experimentation and a multidisciplinary approach to AI development. This approach must take into account the constant evolution and updating of the technology, and the need to continuously review the process and framework. In addition, it is important to pay attention to ethical issues and the commitment to mitigating bias and inaccuracies in information. This framework, although promising, has room for improvement and updates that should be considered after its first tests and practical applications. The suggestion for future work is to test this framework to validate the increase in work efficiency, improvement in creativity and problem management.

Considering that this tool has a free version with more limited functionalities, there may be challenges to the accessibility of this tool, derived from the associated cost, which ultimately does not advocate equitable access to AI technologies. So, while the AI-Driven Design Thinking Framework offers a promising path forward, it is crucial to navigate its implementation with a critical perspective on these challenges, setting the stage for a future in which AI and human creativity merge to redefine the boundaries of design thinking.

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APPENDIX A: QUESTIONNAIRE INVITATION

Espero que este e-mail o encontre bem. O meu nome é Catarina Casquinha e estou atualmente a desenvolver uma tese como parte integrante do meu Mestrado na NOVA IMS e, por isso, estou a entrar em contacto para pedir a sua perspetiva para este estudo que visa explorar o impacto do ChatGPT no processo de Design Thinking, especificamente na indústria publicitária.

O processo de Design Thinking tem sido muito utilizado nos últimos anos como princípio base para o desenvolvimento de criatividade, inovação e até de soluções para problemas, fornecendo um framework estruturado, mas flexível, para o pensamento criativo e a inovação (em anexo está o framework exemplificativo). O processo baseia-se em 5 fases principais:

1. Empatia- É uma fase de conhecimento sobre as necessidades e desejos do target, usando a empatia para ver, sentir e experienciar como se fossemos essas pessoas. Assim garantimos conhecer da melhor forma possível o contexto do público-alvo.
2. Definição- Esta fase trata-se de identificar o problema do target de forma clara e objetiva.
3. Idealização- Altura em que se gera o máximo de soluções possíveis para o problema, sempre com base nas necessidades apresentadas. Esta é a fase da criatividade pura, de pensar fora da caixa.
4. Protótipo- Esta etapa serve para colocar as ideias em prática. De acordo com a Stanford d.school, “um protótipo pode ser qualquer coisa com a qual o utilizador pode interagir – desde uma parede de post-its, até um dispositivo, uma atividade de role-playing ou uma história em banda desenhada.”
5. Testes- A última fase é a fase de testes. Aqui apresentamos os protótipos criados ao cliente. Esta etapa do Design Thinking serve para melhorar as ideias e soluções.

Nos últimos anos, houve uma evolução no campo da Inteligência Artificial com aparecimento de ferramentas de acesso livre, como o ChatGPT, que servem como recursos auxiliares com potencial de melhorar significativamente o processo criativo. A minha tese visa aprofundar esta interação dinâmica entre a IA e o Design Thinking e procura especificamente entender como profissionais estão a integrar o ChatGPT nos seus workflows assim como os potenciais benefícios e desafios da sua integração no processo de Design Thinking, e o seu impacto geral na criatividade e resolução de problemas.

A sua experiência e especialização na área da publicidade vão ser muito úteis para esta pesquisa e ficaria muito agradecida se pudesse dispensar algum tempo para completar um breve questionário, que não deverá levar mais de 15 minutos. As suas respostas serão fundamentais para moldar uma compreensão abrangente do futuro destas ferramentas de IA na publicidade, particularmente dentro do framework de Design Thinking.

As suas respostas serão mantidas em confidencialidade e utilizadas apenas para fins académicos. Agradecia se pudesse completar o questionário até ao final desta semana.

APPENDIX B: QUESTIONNAIRES

Questionnaire 1

Job: Art Director/Designer

Agency ID: AGEN1

Q1: Can you describe how you have integrated ChatGPT into your professional workflow?

O uso do ChatGPT enquanto Director de Arte tem-me servido para a concepção de textos explicativos e/ou raciocínios para melhor descrever um projecto ou ideia. Para conseguir explicar uma ideia, normalmente costumo estruturar em 3 parâmetros: Insight, Ideia e Resultado. Ao usar o ChatGPT consigo sintetizar de uma forma simples e rápida, aquilo que teria de pensar e consequentemente levar mais tempo a fazer.

Q2: Considering what you described, where you find ChatGPT most beneficial?

Para mim ChatGPT é benéfico no momento da conceptualização da ideia e também em brainstorm, muitas vezes para despistar se é ou não viável determinada ideia.

Q3: In which specific stages of the Design Thinking process do you see the integration of ChatGPT being most beneficial?

Penso que o ChatGPT é bastante eficiente para a materialização de textos explicativos em determinados projectos, uma vez que o resultado em si, é uma boa base para se trabalhar em cima. Não acho que seja melhor na sugestão de ideias criativas em si, em comparação a um humano, mas na questão na concepção de textos é bastante mais rápido e eficiente.

Q4: What potential benefits do you foresee from incorporating ChatGPT-4 into Design Thinking?

Optimização do tempo que levamos na criação de textos explicativos em determinados projectos. Ao otimizar esse tempo, temos muito mais tempo para a parte criativa e da real concepção do projecto em si.

Q5: What challenges or limitations do you anticipate might arise from integrating ChatGPT into Design Thinking?

A nível de motor de busca, para responder a determinadas questões, acaba por ser limitado, visto o ChatGPT ter somente uma base de informação que só vai até ao ano 2021. Os filtros em si, também acabam por ser um pouco limitadores, visto que existem várias restrições sobre a busca de resultados de informação de determinados conteúdos/temas. Penso que tal como o google, deveria existir uma opção que pudesse não ser desbloqueada, e não estar sujeita a filtros restritivos por definição.

Q6: In what ways do you think ChatGPT can enhance creativity and problem-solving within Design Thinking?

Penso que a integração desta ferramenta a nível criativo pode ajudar na procura de insight, e informação. A nível de tentar encontrar alguma resposta ou resultado criativo, penso que a ferramenta em si ainda terá que aprender e melhorar bastante.

Questionnaire 2

Job: Account Manager

Agency ID: AGEN1

Q1: Can you describe how you have integrated ChatGPT into your professional workflow?

I've integrated ChatGPT as a collaborative tool in my professional workflow, shaping my thinking approach. But just as a help to mostly start the process.

Essentially, ChatGPT enhances my workflow by fostering my thinking process.

Q2: Considering what you described, where you find ChatGPT most beneficial?

In the initial strategy formulation phase. It aids in ideation, generating some insights and creative concepts that serve as a valuable resource for my strategic planning.

Q3: In which specific stages of the Design Thinking process do you see the integration of ChatGPT being most beneficial?

During "Ideate," offers subtle help, providing some general insights for market and competition research. But just in a way for me to start and go into more in-depth research. It helps me organize my thoughts. In the "Prototype" stage as well - in strategy planning. A discreet integration ensures a more streamlined process, offering valuable input without overshadowing the creative brief writing and strategic planning aspects of my role.

Q4: What potential benefits do you foresee from incorporating ChatGPT-4 into Design Thinking?

While ChatGPT-4 aids in the creative/problem-solving process, my approach is a synthesis of external insights and personal knowledge. It serves as a helpful complement, but the final decisions are based on my own thinking and research.

Q5: What challenges or limitations do you anticipate might arise from integrating ChatGPT into Design Thinking?

Integrating ChatGPT into Design Thinking may present challenges like over-reliance on AI-generated content and potential biases.

Q6: In what ways do you think ChatGPT can enhance creativity and problem-solving within Design Thinking?

It aids in the Design Thinking process, subtly contributing to problem-solving while avoiding over-reliance on AI-generated content and potential biases.

Questionnaire 3

Job: Copywriter

Agency ID: AGEN1

Q1: Can you describe how you have integrated ChatGPT into your professional workflow?

Considero que fui, de certo modo, uma early adopter do ChatGPT, e a sua função no meu método de trabalho tem se mantido muito semelhante. É uma ferramenta útil para uma fase embrionária de qualquer ideia. Ajuda-me, especialmente a desbloquear outros pontos de vista ou a dar "pistas" para outro caminho. No entanto, sinto que isso só acontece com alguma interpretação. Por exemplo, se lanço um prompt como "Sugere ideias para um headline sobre x", é muito raro que o output seja bom o suficiente para escolher uma das hipóteses, no entanto, o que eu acabo por produzir pode ir buscar alguma inspiração às sugestões.

Q2: Considering what you described, where you find ChatGPT most beneficial?

Considero mais benéfico na parte de brainstorming. Como expliquei antes é útil para gerar muitas ideias, para analisá-las e perceber se há alguma que possa ser aproveitada ou se pode servir como ponto de partida para outras ideias.

Q3: In which specific stages of the Design Thinking process do you see the integration of ChatGPT being most beneficial?

Considerando o método de design thinking, penso que pode ser mais útil na fase de idealização, mas quase como uma pré-idealização. Como um primeiro passo de brainstorming. Os outputs acabam por ajudar-me a desbloquear outras ideias.

Q4: What potential benefits do you foresee from incorporating ChatGPT-4 into Design Thinking?

Considerando que o ChatGPT-4 é uma ferramenta mais fiável e "desenvolvida" pode ser mais útil no processo criativo no sentido em que pode gerar respostas que se adaptam melhor aos prompts. A versão gratuita do ChatGPT, de certo modo, não é uma ferramenta de criatividade, a versão 4 pode aproximar-se mais disso.

Q5: What challenges or limitations do you anticipate might arise from integrating ChatGPT into Design Thinking?

Sinto que, mais do que desafios, o ChatGPT ainda tem muitas limitações. Pode ser uma ferramenta útil para desbloquear caminhos e até para procurar alguma informação básica, e nesse sentido, pode poupar algum tempo, mas não acho que tenha o potencial para cumprir, autonomamente, o processo completo.

Q6: In what ways do you think ChatGPT can enhance creativity and problem-solving within Design Thinking?

É útil no processo de brainstorming e pesquisa e, nesse sentido, pode ajudar a encurtar certas partes do processo. No entanto, penso que não é igualmente útil para todas as tarefas criativas, depende da complexidade do pedido ou do tema.

E apesar de ainda não ser uma ferramenta perfeita, prefiro sempre usar, mesmo que os resultados que me dá não sejam úteis.

Questionnaire 4

Job: Copywriter

Agency ID: AGEN2

Q1: Can you describe how you have integrated ChatGPT into your professional workflow?

Initially, it was suggested to me by the Creative Director himself. We began to use it and then it rapidly became a daily use tool.

Q2: Considering what you described, where you find ChatGPT most beneficial?

It has become a support tool for the initial brainstorm and for quickly completing some micro-writing tasks (emails, letters, summary paragraphs). It always needs a touch of human revision on my part, but it's a useful ally.

Q3: In which specific stages of the Design Thinking process do you see the integration of ChatGPT being most beneficial?

Empathize and Define stages.

Q4: What potential benefits do you foresee from incorporating ChatGPT-4 into Design Thinking?

GPT Chat can detect inconsistencies and predict problems in our line of thought, and is an important assistant when it comes to building ideas that are creative but strategically functional.

Q5: What challenges or limitations do you anticipate might arise from integrating ChatGPT into Design Thinking?

The vast facilities offered by Chat GPT could lead to a certain inertia in the process of conceiving ideas, generating a scenario of very similar campaigns with little degree of differentiation.

Q6: In what ways do you think ChatGPT can enhance creativity and problem-solving within Design Thinking?

It's hard to get an idea. But it's even harder to choose the best execution. AI is very useful when it comes to suggesting practical and realistic executions for a bold and original idea.

Questionnaire 5

Job: Account manager

Agency ID: AGEN2

Q1: Can you describe how you have integrated ChatGPT into your professional workflow?

Summarizing information, look for specific information on a given subject

Q2: Considering what you described, where you find ChatGPT most beneficial?

Information gathering.

Q3: In which specific stages of the Design Thinking process do you see the integration of ChatGPT being most beneficial?

Enphatize and define.

Q4: What potential benefits do you foresee from incorporating ChatGPT-4 into Design Thinking ?

Gathering knowledge and assesing potential solutions.

Q5: What challenges or limitations do you anticipate might arise from integrating ChatGPT into Design Thinking?

Information breaches (related with data security and rgpd), asking the right questions and filtering information

Q6: In what ways do you think ChatGPT can enhance creativity and problem-solving within Design Thinking?

Little impact.

Questionnaire 6

Job: Designer

Agency ID: AGEN2

Q1: Can you describe how you have integrated ChatGPT into your professional workflow?

Enquanto Designer, o ChatGPT é uma ferramenta complementar no meu processo criativo. Geralmente, utilizo para desenvolver copies ou fazer brainstormings de forma rápida e consistente.

Q2: Considering what you described, where you find ChatGPT most beneficial?

O facto de apresentar vários conceitos, economiza o nosso tempo de trabalho e aumenta a produtividade. Além disso, serve como fonte de inspiração, proporcionando insights criativos para futuros projetos.

Q3: In which specific stages of the Design Thinking process do you see the integration of ChatGPT being most beneficial?

Nas etapas iniciais dos projetos. Na Definição, recolhe informação clara e sucinta e fornece recursos para chegar à melhor solução. Na idealização, ajuda a analisar a questão em diferentes perspectivas.

Q4: What potential benefits do you foresee from incorporating ChatGPT-4 into Design Thinking?

Apresenta caminhos mais inovadores, aumenta a diversidade de ideias, facilita a explicação de conceitos mais complexos e adapta soluções de forma eficaz.

Q5: What challenges or limitations do you anticipate might arise from integrating ChatGPT into Design Thinking?

Apesar do ChatGPT ser capaz de produzir qualquer tipo de conteúdo, pode limitar a nossa autonomia e o pensamento mais crítico durante o processo criativo.

Q6: In what ways do you think ChatGPT can enhance creativity and problem-solving within Design Thinking?

O ChatGPT pode aumentar a criatividade devido à quantidade de informação que fornece e ao facto de dar feedback imediato sobre as ideias apresentadas.

Questionnaire 7

Job: Designer

Agency ID: AGEN3

Q1: Can you describe how you have integrated ChatGPT into your professional workflow?

Utilizo como forma de desbloquear o pensamento criativo, através de palavras-chave ajuda me na fase inicial do projeto como ferramenta de brainstorm

Q2: Considering what you described, where you find ChatGPT most beneficial?

Considero ser uma ferramenta de pesquisa onde a informação se encontra mais focalizada, através de links e páginas de pesquisa consigo filtrar rapidamente ganhando tempo

Q3: In which specific stages of the Design Thinking process do you see the integration of ChatGPT being most beneficial?

Na fase inicial de pesquisa, recolha de informação e brainstorm.

Q4: What potential benefits do you foresee from incorporating ChatGPT-4 into Design Thinking?

Muitas vezes as pessoas que trabalham na indústria criativa em determinadas fases do projeto tem falta de inspiração criativa, sendo o chatgpt uma boa ferramenta para aumentar os inputs

Q5: What challenges or limitations do you anticipate might arise from integrating ChatGPT into Design Thinking?

As respostas sejam pré-formatados podendo qualquer pessoa alcançar o mesmo tipo de respostas. Dando os mesmos inputs obter se sempre as mesmas respostas.

Por outro lado isso pode já acontecer uma vez que os criativas ontem já hoje inspiração das mesmas fontes

Q6: In what ways do you think ChatGPT can enhance creativity and problem-solving within Design Thinking?

Aumenta a produtividade, pesquisa mais direta e desbloqueio da criatividade

Questionnaire 8

JOB: Creative Director/Copywriter

Agency ID: AGEN2

Q1: Can you describe how you have integrated ChatGPT into your professional workflow?

É uma ferramenta de apoio à pesquisa de insights e informação, servindo, por vezes, de desbloqueador para encontrar ângulos inesperados em brainstorm. Nunca tomo como certa a informação obtida. Não confio ainda a esse ponto. Para elaborar textos também não costumo usar.

Q2: Considering what you described, where you find ChatGPT most beneficial?

Procura de insights e fazer brainstorm.

Q3: Q3: In which specific stages of the Design Thinking process do you see the integration of ChatGPT being most beneficial?

Empatia e Idealização.

Q4: What potential benefits do you foresee from incorporating ChatGPT-4 into Design Thinking?

Interação com grandes blocos de informação que surgem de forma orgânica e espontânea no processo de pesquisa. Não é tão fácil sermos surpreendidos por informação inesperada numa pesquisa tradicional em browser. Sobretudo isso, diálogo casual com informação que parece infinita.

Q5: What challenges or limitations do you anticipate might arise from integrating ChatGPT into Design Thinking?

Robotização de processos. Pouca espaço para poesia e instinto.

Q6: In what ways do you think ChatGPT can enhance creativity and problem-solving within Design Thinking?

Ir para além do óbvio ao ter acesso a informação que — se o algoritmo não for enviesado (que talvez o seja) — não é imediata.

Questionnaire 9

Job: Account and events manager

Agency ID: AGEN3

Q1: Can you describe how you have integrated ChatGPT into your professional workflow?

I work in event building and management for a really established company in the market, therefore a lot of the processes are well-established and structured. However, since I do have some copywriting to do, as well as a lot of meetings to prepare for these events, I use ChatGPT not only to get some ideas in terms of potential pitches that I'll need to do but also to summarize information from these meetings to prepare for the events. ChatGPT is just a tool I use for getting the most accurate and up-to-date information or sources of information.

Q2: Considering what you described, where you find ChatGPT most beneficial?

ChatGPT is the most useful tool for stages like planning, structuring, and organizing processes and information.

Q3: In which specific stages of the Design Thinking process do you see the integration of ChatGPT being most beneficial?

In the empathize and define stages. Integrating ChatGPT into the Design Thinking process can significantly enhance the Empathize and Define stages of planning different scenarios. But also in the ideation stage to brainstorm ideas. In the planning stage, ChatGPT can be utilized to explore various organizational strategies for product launches or campaign launches. It can assist in envisioning different scenarios and potential outcomes, providing a broad perspective on the possible impacts of a product or service launch.

Q4: What potential benefits do you foresee from incorporating ChatGPT-4 into Design Thinking?

ChatGPT can be employed to summarize key points and discussions, this not only aids in creating concise and easy-to-understand notes but also offers considerable time-saving benefits and serves as a good starting point for gathering information.

Q5: What challenges or limitations do you anticipate might arise from integrating ChatGPT into Design Thinking?

Some problems that I feel are intrinsically connected with integrating chatgpt into design thinking are not only the fact that you might be completely bombed with a lot of non-worthy and accurate information. It might also create some confusion if you're not 100% sure of what you need and sometimes it might cause some chaos.

Q6: In what ways do you think ChatGPT can enhance creativity and problem-solving within Design Thinking?

In general gathering and summarising information and also to test some ideas and scenarios.

Questionnaire 10

Job: Copywriter

Agency ID: AGEN3

Q1: Can you describe how you have integrated ChatGPT into your professional workflow?

Uso o ChatGPT pontualmente quando preciso de desbloquear alguma ideia com a qual começo a ficar frustrada, para encontrar sinónimos ou palavras da mesma família e para pesquisas simples que não exijam rigor científico (num processo de brainstorming ele é muitas vezes mais prático para encontrar insights do que divagar pela SERP do Google).

Q2: Considering what you described, where you find ChatGPT most beneficial?

Como ponto de partida para gerar keywords num brainstorming e quando estou presa num raciocínio e preciso de novas hipóteses ou pontos de vista.

Q3: In which specific stages of the Design Thinking process do you see the integration of ChatGPT being most beneficial?

Considerando o rigor duvidoso das respostas que a ferramenta apresenta, considero-o mais útil na fase de criar ideias — aí, ele é um bom aliado para explorar insights e desconstruir conceitos. Na fase do protótipo, quando o projeto é de escrita criativa, o ChatGPT também pode ser um bom apoio para encontrar a palavra certa.

Q4: What potential benefits do you foresee from incorporating ChatGPT-4 into Design Thinking or any other creative/problem-solving process?

Acho que a ferramenta agiliza muitas vezes o processo de pesquisa, além de ser uma boa forma de dinamizar um brainstorming.

Q5: What challenges or limitations do you anticipate might arise from integrating ChatGPT into Design Thinking?

A falta de rigor científico das respostas é uma limitação de muito peso, é fácil assumir uma justificação do ChatGPT como certa e ela não estar, o que faz da ferramenta uma fonte que tem sempre que ser verificada e que muitas vezes nos pode induzir em erro. Acho que o seu uso frequente pode ter um impacto negativo no desenvolvimento da capacidade criativa pessoal. Se o assumirmos como um primeiro passo em qualquer fase criativa estamos a privar o nosso cérebro de fazer esse processo, o que pode levar à habituação e a um consequente "atraso" no desenvolvimento da habilidade criativa. É como quando me passaram uma calculadora para as mãos nas aulas de matemática, muito útil, mas esqueci-me da tabuada. Ainda, também é fácil ver o cidadão comum a "abusar" deste recurso para escrever emails, artigos, projetos e outras coisas no seu dia a dia. Isso faz com que esses pequenos textos não contemplem a personalidade e a criatividade de quem os está a enviar, o que é uma perda preciosa para as relações interpessoais.

Q6: In what ways do you think ChatGPT can enhance creativity and problem-solving within Design Thinking?

Acho que esta ferramenta pode dinamizar o processo criativo e ajudar a explorar ideias.

Questionnaire 11

Job: Account Manager

Agency ID: AGEN1

Q1: Can you describe how you have integrated ChatGPT into your professional workflow?

Chatgpt is a tool I use daily to simplify processes such as translating text, rewriting emails or even searching for different ideas for certain topics. I also look for information, but always check the sources used.

Q2: Considering what you described, where you find ChatGPT most beneficial?

Brainstorm, test some ideas or hypotheses, and synthesise information.

Q3: In which specific stages of the Design Thinking process do you see the integration of ChatGPT being most beneficial?

In the "Empathize" and "Define" phases, ChatGPT can be useful for researching and gathering information from various sources, as well as synthesizing it. In the "Ideate" phase the tool can be useful for brainstorming and in the "Prototype" phase it also might be useful for seeking feedback and alternative ideas.

Q4: What potential benefits do you foresee from incorporating ChatGPT-4 into Design Thinking or any other creative/problem-solving process?

Faster responses in the process and more easily available information.

Q5: What challenges or limitations do you anticipate might arise from integrating ChatGPT into Design Thinking?

Potentially wrong information and biased information. Uncreative writing and a great need for human thought to accompany the information so that it doesn't become strange or random.

Q6: In what ways do you think ChatGPT can enhance creativity and problem-solving within Design Thinking?

It facilitates creative and problem-solving processes through rapid assistance and availability of information, providing feedback on our ideas and finding some solutions to our problems.

Questionnaire 12

Job: Creative Director

Agency ID: AGEN1

Q1: Can you describe how you have integrated ChatGPT into your professional workflow?

Como profissional na área da criatividade, a minha utilização do ChatGPT prende-se essencialmente a três pontos: 1) Em primeiro lugar, na sistematização e pesquisa de informações, referências e publicações sobre determinado assunto;

2) Em segundo, na prototipação de ideias ou headlines possíveis para campanhas;

3) Por último, na criação de nomes. De salientar que, na verdade, tendo a usar o ChatGPT como dupla criativa, de forma a abrir novas possibilidades e caminhos. Apesar de considerar que, em alguns casos, é possível utilizar "ipsis verbis" o que é criado pela ferramenta, ainda não estamos no ponto em que o GPT (ou qualquer outra ferramenta de inteligência artificial) consegue substituir o trabalho de um criativo, sobretudo no que diz respeito à inovação e disrupção.

Contudo, no que toca à performance e trabalho de uma agência de media, aí diria que sim – é um meio rápido e eficaz de produzir mensagens que, não sendo especialmente criativas, são funcionais e ajustadas a um target específico. Julgo, também, que a ferramenta terá sido treinada para este efeito em particular, e que tem mais tendência para criar copy "gerador de leads" do que pensar em ideias inovadoras.

Q2: Considering what you described, where you find ChatGPT most beneficial?

Como disse anteriormente, diria que é mais benéfico na pesquisa, para resolver bloqueios, e para procurar formulações alternativas de headlines. Ainda estamos, contudo, numa fase muito prematura. Seria espetacular se conseguisse produzir PDFs e racionais criativos já paginados.

Q3: In which specific stages of the Design Thinking process do you see the integration of ChatGPT being most beneficial?

Diria que a problematização estará sempre do lado humano – bem como o skill técnico para "fazer a pergunta certa".

Mas a integração do ChatGPT no processo pode revelar-se incrivelmente útil das fases 2 - 4, ou seja, ajudando na definição do problema do target, procurando gerar soluções e prototipando. Contudo, a sua utilidade no processo pode não ser tão linear quanto o descrito: a fase de prototipagem pode ajudar a clarificar a definição do problema do target, e a sistematização da pesquisa pode interferir no tipo de soluções propostas para o problema. Ou seja, na minha opinião, diria que poderá ter um papel mais abrangente, pelo menos nesta fase.

Uma ferramenta que amplifica o processo como um todo. Falando diretamente em criatividade, é contudo uma ferramenta limitada, uma vez que ainda se baseia apenas em texto. Pelo que diria que pode ser usado com um uma espécie de motor de busca em esteróides, com capacidade de sintetização de informação e produção de algumas soluções básicas. Mas essa sistematização revela-se extremamente útil porque, por vezes, torna evidente algo que à partida não o era.

Q4: What potential benefits do you foresee from incorporating ChatGPT-4 into Design Thinking or any other creative/problem-solving process?

Acho que, à medida que a ferramenta vai melhorando, ela pode de forma mais deliberada e eficaz contribuir para todo o processo, sobretudo se começar a basear-se em experiências passadas. Por outro lado, o facto de o modelo de "machine learning" se basear em datasets predefinidos acaba por criar um "bias" que irá viciar sempre os resultados. Diria que, por enquanto, as ciências exatas são o campo que mais irá beneficiar da inteligência artificial, e que a criatividade e a inovação vão precisar sempre do cunho humano.

Q5: What challenges or limitations do you anticipate might arise from integrating ChatGPT into Design Thinking?

Se toda a gente usar o ChatGPT para tentar resolver um mesmo problema, e ninguém construir sobre o assunto, provavelmente chegarão à mesma solução. E o facto de existirem soluções idênticas para o mesmo problema vai tornar-se, a curto e médio prazo, no problema em si. Então, a forma de resolver o problema já não passa pelo caminho mais direto de A - B, mas sim na forma como podemos criar uma "volta maior". E voltamos à criatividade de novo, que será cada vez mais especializada em fazer as perguntas certas, mais do que encontrar as respostas. São os meus 50 cêntimos relativamente ao futuro, pelo menos com base no que vemos atualmente.

Q6: In what ways do you think ChatGPT can enhance creativity and problem-solving within Design Thinking?

Julgo que a sua principal utilidade passa pela sistematização e pela criação rápida de protótipos, do ponto de vista da formulação de frases e ideias. Acho que é extremamente útil integrar o ChatGPT como parte integrante do brainstorm – no fundo, como mais um local onde é possível partilhar ideias, explorar caminhos e utilizar para reformular e rever alguns pressupostos que fazem parte de todo o processo.

APPENDIX C: CODEBOOK

CODEBOOK			
CODE GROUP	CODE	CODE DESCRIPTION	INTERVIEW QUOTATIONS
Enhancement of Creative Processes	Efficient Copywriting	Utilizing ChatGPT to produce creative content and explanatory texts rapidly, improving communication and project descriptions.	"O uso do ChatGPT enquanto Director de Arte tem-me servido para a concepção de textos explicativos e/ou raciocínios para melhor descrever um projeto ou ideia." "For quickly completing some micro-writing tasks (emails, letters, summary paragraphs)." "...desenvolver copies..." "... para elaborar textos também costumo usar." "... simplify processes such as translating text, rewriting emails..." "o ChatGPT é bastante eficiente para a materialização de textos explicativos em determinados projectos" "facilita a explicação de conceitos mais complexos e adapta soluções de forma eficaz" "Optimização do tempo que levamos na criação de textos explicativos em determinados projectos." "na concepção de textos é bastante mais rápido e eficiente" "... headlines possíveis para campanhas..." "... é um meio rápido e eficaz de produzir mensagens..." "... procurar formulações alternativas de headlines..."
	Conceptualization of Ideas	Employing ChatGPT in the early stages to generate and develop new ideas, enhancing the creative process by exploring various possibilities.	"É uma ferramenta útil para uma fase embrionária de qualquer ideia" "... útil para gerar muitas ideias..." "Considerando que o ChatGPT-4 é uma ferramenta mais fiável e "desenvolvida" pode ser mais útil no processo criativo no sentido em que pode gerar respostas que se adaptam melhor aos prompts." "... conceptualização da ideia..." "... ideation, generating some insights and creative concepts..." "...important assistant when it comes to building ideas that are creative but strategically functional." "... apresentar vários conceitos..." "... procura de insights..." "... prototipação de ideias..."
	Creative Insights	Using ChatGPT to gather insights and relevant information, aiding in the creative process and the exploration of new ideas.	"Penso que a integração desta ferramenta a nível criativo pode ajudar na procura de insigh..." "... proporcionando insights criativos..." "... aumentar a criatividade..." "... em determinadas fases do projeto tem falta de inspiração criativa, sendo o chatgpt uma boa ferramenta para aumentar os inputs." "... ferramenta de apoio à pesquisa de insights..." "Não é tão fácil sermos surpreendidos por informação inesperada numa pesquisa tradicional em browser."

			"Ir para além do óbvio ao ter acesso a informação que — se o algoritmo não for enviesado (que talvez o seja) — não é imediata." "I use ChatGPT not only to get some ideas..." "...processo de brainstorming ele é muitas vezes mais prático para encontrar insights..." "... ferramenta pode dinamizar o processo criativo e ajudar a explorar ideias..." "... na criação de nomes..."
	Complementary Tool for Creative Enhancement	Viewing ChatGPT as a supportive tool that complements creative efforts, enhancing the overall creative output.	"... é uma boa base para se trabalhar em cima." "It serves as a helpful complement..." "help to mostly start the process" "... important assistant when it comes to building ideas that are creative but strategically functional." "... desbloqueio da criatividade..." "... ferramenta pode dinamizar o processo criativo e ajudar a explorar ideias..."
	Brainstorming	Viewing ChatGPT as a supportive tool that complements creative efforts, enhancing the overall creative output.	"...brainstorm..." "... considero mais benéfico na parte de brainstorming..." "... processo de brainstorming e pesquisa..." "...support tool for the initial brainstorm..." "...brainstormings..." "...ajuda me na fase inicial do projeto como ferramenta de brainstorm..." "...fazer brainstorms..." "...desbloqueador para encontrar ângulos inesperados em brainstorms..." "...brainstorm ideas..." "...processo de brainstorming ele é muitas vezes mais prático para encontrar insights." "... ponto de partida para gerar keywords num brainstorming..." "...boa forma de dinamizar um brainstorming..." "...brainstorm..." "... the tool can be useful for brainstorming..." "... parte integrante do brainstorm..."
	Inspiration Search	Using ChatGPT as a source of inspiration, exploring various concepts and ideas to spark creativity.	"... o que eu acabo por produzir pode ir buscar alguma inspiração às sugestões." "... fonte de inspiração..." "... em determinadas fases do projeto tem falta de inspiração criativa, sendo o chatgpt uma boa ferramenta para aumentar os inputs..." "Procura de insights..." "...quando estou presa num raciocínio e preciso de novas hipóteses ou pontos de vista." "... abrir novas possibilidades e caminhos..." "... sistematização e pela criação rápida de protótipos, do ponto de vista da formulação de frases e ideias."
	Diversity of ideas	Using ChatGPT to discover new and innovative approaches	"Apresenta caminhos mais inovadores..."

		to creative projects and problem-solving.	
	Innovative paths	Employing ChatGPT to generate a wide range of ideas, fostering diversity in creative thinking and solutions.	"... aumenta a diversidade de ideias..." "... it also might be useful for seeking feedback and alternative ideas."
Efficiency and Workflow Enhancement	Efficient Synthesis of Ideas	Employing ChatGPT to condense complex concepts and discussions into simplified, easily understandable summaries, thereby accelerating the creative process.	"Ao usar o ChatGPT consigo sintetizar de uma forma simples e rápida, aquilo que teria de pensar e consequentemente levar mais tempo a fazer." "While ChatGPT-4 aids in the creative/problem-solving process, my approach is a synthesis of external insights and personal knowledge." "for quickly completing some micro-writing tasks (emails, letters, summary paragraphs)" "facilita a explicação de conceitos mais complexos e adapta soluções de forma eficaz" "ChatGPT can be employed to summarize key points and discussions" "synthesize information" "as well as synthesizing it" "Summarizing information..." "...also to summarize information from these meetings to prepare for the events." "...gathering and summarising information..." "... a fase de prototipagem pode ajudar a clarificar a definição do problema do target, e a sistematização da pesquisa pode interferir no tipo de soluções propostas para o problema." "... sistematização e pela criação rápida de protótipos, do ponto de vista da formulação de frases e ideias."
	Collaborative Workflow Efficiency	Integrating ChatGPT to enhance collaboration among team members, facilitating a more efficient and dynamic workflow.	"I've integrated ChatGPT as a collaborative tool in my professional workflow, shaping my thinking approach." "... ferramenta complementar no meu processo criativo..."
	Planning and Organizing Processes	Leveraging ChatGPT for better planning and organizing of creative projects, enhancing project management and efficiency.	"It helps me organize my thoughts." "ChatGPT is the most useful tool for stages like planning, structuring, and organizing processes and information."
	Streamlined Process	Integrating ChatGPT to streamline creative and operational processes, making them more efficient and effective.	"A discreet integration ensures a more streamlined process, offering valuable input without overshadowing the creative brief writing..." "...help to mostly start the process..." "... facilita a explicação de conceitos mais complexos e adapta soluções de forma eficaz..." "... agiliza muitas vezes o processo de pesquisa..."

	Efficiency in Time Management	Utilizing ChatGPT to save time on routine tasks, allowing more focus on creative and strategic activities.	"... otimizar esse tempo, temos muito mais tempo para a parte criativa..." "...pode poupar algum tempo..." "... pode ajudar a encurtar certas partes do processo..." "... economiza o nosso tempo..." "... consigo filtrar rapidamente ganhando tempo..." "... offers considerable time-saving benefits." "Faster responses in the process..." "Optimização do tempo que levamos na criação de textos explicativos em determinados projectos."
	Quick Adoption and Integration	Highlighting the rapid integration of ChatGPT into daily workflows, becoming an essential tool for creative and operational tasks.	"We began to use it and then it rapidly became a daily use tool." "Chatgpt is a tool I use daily..."
	Information Search	Using ChatGPT to conduct targeted searches for relevant information.	"Penso que a integração desta ferramenta a nível criativo pode ajudar na procura de insight, e informação." "procurar alguma informação básica" "pesquisa mais direta" "gathering and summarising information" "ferramenta pode dinamizar o processo criativo e ajudar a explorar ideias" "It facilitates creative and problem-solving processes through rapid assistance and availability of information" "... look for specific information on a given subject..." "... ferramenta de apoio à pesquisa de insights e informação..." "ChatGPT is just a tool I use for getting the most accurate and up-to-date information or sources of information." "... para pesquisas simples que não exijam rigor científico..." "... searching for different ideas for certain topics..." "...Information gathering." "Gathering knowledge..." "... ferramenta de pesquisa onde a informação se encontra mais focalizada..." "ChatGPT is the most useful tool for stages like planning, structuring, and organizing processes and information." "...serves as a good starting point for gathering information..." "...agiliza muitas vezes o processo de pesquisa..." "ChatGPT can be useful for researching and gathering information from various sources more easily available information..." "... sistematização e pesquisa de informações, referências e publicações sobre determinado assunto..." "...beneficial na pesquisa..."
	Instant feedback	Using ChatGPT to receive immediate feedback on ideas, helping to refine and	"... feedback imediato sobre as ideias apresentadas..." "... providing feedback on our ideas and finding some solutions to our problems."

		improve creative concepts.	
	Productivity Boost	Highlighting the role of ChatGPT in enhancing productivity through efficient task execution and idea generation.	"... aumenta a produtividade" "Aumenta a produtividade..."
	Accessible information	Highlighting the vast amount of easy access to information ChatGPT can provide, aiding in research and creative exploration.	"... quantidade de informação que fornece..." "... pesquisa mais direta..." "It facilitates creative and problem-solving processes through rapid assistance and availability of information..." "... more easily available information..." "Interação com grandes blocos de informação que surgem de forma orgânica e espontânea no processo de pesquisa." "...diálogo casual com informação..."
Strategic Planning and Problem-Solving	Enhanced Creative Problem-Solving	Utilizing ChatGPT to improve the problem-solving process, providing new perspectives and solutions to creative challenges.	"... raciocínios para melhor descrever um projecto ou ideia." "... é uma boa base para se trabalhar em cima." "... ChatGPT enhances my workflow by fostering my thinking process." "...ferramenta complementar no meu processo criativo..." "... desbloquear o pensamento criativo..." "Uso o ChatGPT pontualmente quando preciso de desbloquear alguma ideia com a qual começo a ficar frustrada..."
	Strategy formulation	Applying ChatGPT in strategic planning, using it to generate insights, creative concepts, and strategic directions.	"In the initial strategy formulation phase. It aids in ideation, generating some insights and creative concepts that serve as a valuable resource for my strategic planning." "ChatGPT can be utilized to explore various organizational strategies..."
	Optimizing problem-solving	Employing ChatGPT to contribute to solving problems more efficiently, providing feedback and potential solutions.	"... subtly contributing to problem-solving..." "... providing feedback on our ideas and finding some solutions to our problems."
	Unlocking Alternative Viewpoints	Using ChatGPT to explore different perspectives and alternatives, enhancing creativity and problem-solving.	"Ajuda-me, especialmente a desbloquear outros pontos de vista ou a dar "pistas" para outro caminho." "... desbloqueador para encontrar ângulos inesperados..." "... quando estou presa num raciocínio e preciso de novas hipóteses ou pontos de vista." "...test some ideas or hypotheses..." "... it also might be useful for seeking feedback and alternative ideas." "... resolver bloqueios..."
	Detect and predict problems	Using ChatGPT to identify potential issues and predict problems before they arise,	"... muitas vezes para despistar se é ou não viável determinada ideia..." "GPT Chat can detect inconsistencies and predict problems in our line of thought..."

		aiding in proactive problem-solving.	"It can assist in envisioning different scenarios and potential outcomes, providing a broad perspective on the possible impacts of a product or service launch."
	Practical Execution Suggestions	Employing ChatGPT to suggest realistic and actionable steps for implementing creative ideas and strategies.	"AI is very useful when it comes to suggesting practical and realistic executions for a bold and original idea." "It can assist in envisioning different scenarios and potential outcomes, providing a broad perspective on the possible impacts of a product or service launch." "...to test some ideas and scenarios." "... test some ideas or hypotheses..." "... providing feedback on our ideas and finding some solutions to our problems."
	Potential Solutions	Leveraging ChatGPT to explore and evaluate potential solutions to creative and operational challenges.	"... assessing potential solutions..." "It can assist in envisioning different scenarios and potential outcomes, providing a broad perspective on the possible impacts of a product or service launch." "...test some ideas or hypotheses..."
Challenges and Limitations	Search Engine Limitations	Acknowledging the constraints of ChatGPT as a search tool, including its limitations in accessing real-time or highly specific information.	"A nível de motor de busca, para responder a determinadas questões, acaba por ser limitado..." "Os filtros em si, também acabam por ser um pouco limitadores, visto que existem várias restrições sobre a busca de resultados de informação de determinados conteúdos/temas."
	Awareness of Potential Biases	Recognizing and addressing the biases that may be present in AI-generated content, ensuring a balanced and fair perspective.	"... challenges like over-reliance on AI-generated content and potential biases..." "Nunca tomo como certa a informação obtida. Não confio ainda a esse ponto." "... bombed with a lot of non-worthy and accurate information..." "... biased information..." "... o facto de o modelo de "machine learning" se basear em datasets predefinidos acaba por criar um "bias" que irá viciar sempre os resultados..."
	Recognizing Creative Boundaries of AI	ChatGPT's lack of capabilities for creative responses.	"Não acho que seja melhor na sugestão de ideias criativas..." "A nível de tentar encontrar alguma resposta ou resultado criativo, penso que a ferramenta em si ainda terá que aprender e melhorar bastante." "... é muito raro que o output seja bom o suficiente para escolher uma das hipóteses..." "A versão gratuita do ChatGPT, de certo modo, não é uma ferramenta de criatividade não acho que tenha o potencial para cumprir, autonomamente, o processo completo." "... penso que não é igualmente útil para todas as tarefas criativas, depende da complexidade do pedido ou do tema..." "Pouca espaço para poesia e instinto." "Uncreative writing..."

			"Apesar de considerar que, em alguns casos, é possível utilizar "ipsis verbis" o que é criado pela ferramenta, ainda não estamos no ponto em que o GPT (ou qualquer outra ferramenta de inteligência artificial) consegue substituir o trabalho de um criativo, sobretudo no que diz respeito à inovação e disrupção." "Falando diretamente em criatividade, é contudo uma ferramenta limitada, uma vez que ainda se baseia apenas em texto." "... a criatividade e a inovação vão precisar sempre do cunho humano."
	Necessity of Human Oversight	Emphasizing the importance of human review and intervention in refining and validating AI-generated content.	"... final decisions are based on my own thinking and research..." "It always needs a touch of human revision on my part..." "... asking the right questions..." "... faz da ferramenta uma fonte que tem sempre que ser verificada e que muitas vezes nos pode induzir em erro." "... great need for human thought to accompany the information so that it doesn't become strange or random." "Diria que a problematização estará sempre do lado humano – bem como o skill técnico para "fazer a pergunta certa"" "... a criatividade e a inovação vão precisar sempre do cunho humano."
	Data Security	Recognizing the importance of data security and privacy in the use of AI tools like ChatGPT.	"... information breaches (related with data security and rgpd)"
	Autonomy Limitations	Addressing the limitations of ChatGPT in fostering autonomy in creative processes, due to its reliance on input.	"... limitar a nossa autonomia..." "... Dando os mesmos inputs obter se sempre as mesmas respostas."
	Limitations on Critical Thinking	Discussing the potential impact of frequent AI use on the development and exercise of critical thinking skills.	"... pensamento mais crítico durante o processo criativo..." "It might also create some confusion if you're not 100% sure of what you need and sometimes it might cause some chaos." "...uso frequente pode ter um impacto negativo no desenvolvimento da capacidade criativa pessoal..."
	Robotization of processes	Examining the impact of automating routine tasks with ChatGPT, focusing on efficiency and potential drawbacks.	"Robotização de processos..." "Se toda a gente usar o ChatGPT para tentar resolver um mesmo problema, e ninguém construir sobre o assunto, provavelmente chegarão à mesma solução. E o facto de existirem soluções idênticas para o mesmo problema vai tornar-se, a curto e médio prazo, no problema em si."
	Risk and Impact of Overreliance on AI Tools	The consequences of excessive reliance on AI for creative tasks and routine operations, caution against the	"Se o assumirmos como um primeiro passo em qualquer fase criativa estamos a privar o nosso cérebro de fazer esse processo, o que pode levar à habituação e a um consequente "atraso" no desenvolvimento da habilidade criativa."

		potential for reduced creative skill development and critical thinking.	"Ainda, também é fácil ver o cidadão comum a "abusar" deste recurso para escrever emails, artigos, projetos e outras coisas no seu dia a dia." "Isso faz com que esses pequenos textos não contemplem a personalidade e a criatividade de quem os está a enviar, o que é uma perda preciosa para as relações interpessoais."
	Information Quality Challenges	Highlights the issues with outdated, confusing, and incorrect information.	"...visto o ChatGPT ter somente uma base de informação que só vai até ao ano 2021." "... bombed with a lot of non-worthy and accurate information..." "... rigor duvidoso das respostas que a ferramenta apresenta..." "...falta de rigor científico das respostas é uma limitação de muito peso..." "Potentially wrong information..." "...great need for human thought to accompany the information so that it doesn't become strange or random."
	Lack of Creative Differentiation	Addressing the challenge of achieving unique and differentiated creative outputs when relying on AI tools.	"... facilities offered by Chat GPT could lead to a certain inertia in the process of conceiving ideas, generating a scenario of very similar campaigns with little degree of differentiation." "As respostas sejam pré-formatados podendo qualquer pessoa alcançar o mesmo tipo de respostas." "... isso faz com que esses pequenos textos não contemplem a personalidade e a criatividade de quem os está a enviar, o que é uma perda preciosa para as relações interpessoais." "Pouca espaço para poesia e instinto..." "...tem mais tendência para criar copy "gerador de leads" do que pensar em ideias inovadoras..." "Se toda a gente usar o ChatGPT para tentar resolver um mesmo problema, e ninguém construir sobre o assunto, provavelmente chegarão à mesma solução. E o facto de existirem soluções idênticas para o mesmo problema vai tornar-se, a curto e médio prazo, no problema em si."
AI Design Thinking Stages	Empathize Stage	Utilizing ChatGPT in the Empathize stage of Design Thinking to gain deeper insights into user needs, emotions, and experiences.	"... start and go into more in-depth research..." "Empathize and Define stages." "Enphatize and define." "Empatia..." "In the empathize and define stages." "Empathize"
	Define Stage	Applying ChatGPT in the Define stage of Design Thinking to clarify project goals, understand user needs, and define problems more clearly.	"o ChatGPT é bastante eficiente para a materialização de textos explicativos em determinados projectos" "Empathize and Define stages." "Enphatize and define." "Na Definição, recolhe informação clara e sucinta e fornece recursos para chegar à melhor solução." "Na fase inicial de pesquisa, recolha de informação" "In the empathize and define stages." "Define" "Mas a integração do ChatGPT no processo pode revelar-se incrivelmente útil das fases 2 – 4..."

	Ideate Stage	Employing ChatGPT during the Ideate stage of Design Thinking to generate a wide range of ideas and foster creative brainstorming.	"During "Ideate," offers subtle help, providing some general insights for market and competition research." "... pode ser mais útil na fase de idealização, mas quase como uma pré-idealização..." "Na idealização, ajuda a analisar a questão em diferentes perspectivas." "...Brainstorm..." "...Idealização..." "... útil na fase de criar ideias..." "...Ideate..." "Mas a integração do ChatGPT no processo pode revelar-se incrivelmente útil das fases 2 – 4..."
	Prototype Stage	Using ChatGPT in the Prototype stage to assist in developing prototypes, offering suggestions for improvement and iteration.	"In the "Prototype" stage as well - in strategy planning. A discreet integration ensures a more streamlined process, offering valuable input without overshadowing the creative brief writing and strategic planning aspects of my role." "...fase do protótipo..." "Prototype..." "Mas a integração do ChatGPT no processo pode revelar-se incrivelmente útil das fases 2 – 4..."

