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*Artificial intelligence and search engine optimization: The case  
of Bydas Digital Agency.*

José Santiago Encina Jara

Universidade Católica Portuguesa, Business School.

2025.





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*Artificial intelligence and search engine optimization: The case  
of Bydas Digital Agency.*

Final Master's Thesis to be submitted to Universidade Católica Portuguesa,  
in order to obtain a Master's degree in Marketing.

By

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I am approaching the end of an important era for me, and I can only wait for what the future holds.

# Abstract

Digital marketing has evolved at a rapid pace and certain technological advances such as Artificial Intelligence have positioned themselves to develop tasks, commonly referred to as 'human'.

Search Engine Optimization (SEO) have also experienced a remarkable development in recent years, thanks to technological progress. It is here that an intriguing research question arises: *How artificial intelligence influences search engine optimization?*

This type of question has also arisen in different areas, not only in marketing, but also in hundreds of rational and even creative tasks.

We assume that Artificial Intelligence (AI) systems like ChatGPT respond best to logical requests, but today it is capable of crossing millions of data to fulfill creative tasks, that capability that supposedly differentiates humans from “machines”.

This research presents results obtained from different sources, with the aim of comparing the skill of the human beings and AI tools for SEO. The context of such comparison is creative writing and digital marketing.

Keywords: Artificial intelligence (AI), Search Engine Optimization (SEO), Case Study, Bydas Digital Agency, ChatGPT.

## Resumo:

O marketing digital evoluiu a um ritmo acelerado e certos avanços tecnológicos, como a Inteligência Artificial, posicionaram-se para desenvolver tarefas, comumente designadas por “humanas”.

A otimização dos motores de busca (SEO) também conheceu um desenvolvimento notável nos últimos anos, graças ao progresso tecnológico. É aqui que surge uma questão de investigação intrigante: Como é que a inteligência artificial influencia a otimização dos motores de busca?

Este tipo de questão também surgiu em diferentes áreas, não só no marketing, mas também em centenas de tarefas racionais e até criativas.

Partimos do princípio de que os sistemas de Inteligência Artificial (IA), como o ChatGPT, respondem melhor a pedidos lógicos, mas atualmente são capazes de cruzar milhões de dados para cumprir tarefas criativas, essa capacidade que supostamente diferencia os humanos das “máquinas”.

Esta investigação apresenta resultados obtidos a partir de diferentes fontes, com o objetivo de comparar a capacidade dos seres humanos e das ferramentas de IA para SEO. O contexto desta comparação é a escrita criativa e o marketing digital.

Palavras-chave: *Inteligência artificial (IA), Search Engine Optimization (SEO), Estudo de caso, Bydas Digital Agency, ChatGPT.*

(9.962 words)

## Content table

Acknowledgments .....	4
Abstract.....	5
Resumo .....	6
Abbreviations: .....	8
Introduction: .....	9
1. Literature review.....	11
1.1.- Artificial Intelligence.....	11
1.2.-Search Engine Optimization definition .....	13
1.3.- AI and SEO.....	13
2.- Methodology: .....	16
2.1.- Case study.....	16
2.2- Blog experiment .....	17
3.- Case .....	21
3.1 Bydas Digital Agency .....	21
4.- Discussion .....	22
4.1- Interviews.....	22
4.2- Blog Experiment.....	28
4.2.1.- Queries.....	29
4.2.2.- Pages .....	30
5.- Conclusions .....	33
5.1- Artificial intelligence and search engine optimization .....	33
5.2.- Limitations.....	34
5.3- Suggestions for future research .....	35
5.4.- Practical Implications .....	35
Declaration of generative AI and AI-assisted technologies in the writing process .....	37
References .....	38
Appendices .....	40
Appendix 1 .....	40
Appendix 2 .....	41
Appendix 3 .....	43

## Abbreviations:

SEO – Search Engine Optimization  
AI – Artificial Intelligence  
CEO – Chief Executive Officer  
COO – Chief Operating Officer  
SERP – Search Engine Results Pages  
CTR – Click-Through Rate  
LLM – Large Language Model  
NLP – Natural Language Processing  
ML – Machine Learning

## Introduction:

In a world where technological evolution seems to be increasingly rapid, Artificial Intelligence (AI) has become one of the most significant and disruptive advances of the last decade, offering thousands of uses and applications in a variety of personal and work environments. An innovation that has become a valuable tool has also provoked some fear, due to its wide process capability, which would allow it to replace some so-called 'human' tasks.

It is in this context that Artificial Intelligence and Digital Marketing intersect, questioning how Search Engine Optimization (SEO) strategies could be quickly created by AI software's, promising efficiency and results at a low cost in terms of economy, effort and above all, time.

While the concept '*Artificial Intelligence*' was first coined in 1956 by the author John McCarthy, it was only a few years ago, that the concept has been '*in the eye of the storm*', due to the impact of different software's, apps and tools with AI and its 'recent' access to the public on a massive scale.

This study seeks to answer the question of *How artificial intelligence influences Search Engine Optimization?*

This question has escalated rapidly, as tools such as ChatGPT can produce content on a large scale, with '*superhuman*' speed. We will seek to answer this question through primary and secondary sources, focusing on relatively recent information, interviews and a so-called 'experiment'.

These will be used to cross-check information and obtain the best possible results.

On the other hand, the primary information will focus on interviews conducted with the CEO and employees of Bydas Digital Agency, a Digital Marketing and e-Commerce agency in Porto.

The creation of platforms with AI has generated a great impact on the work modality, changing the 'day to day' tasks in the way of working of thousands of people, as well as in the Bydas Digital Agency.

As complementary primary information, a blog was created with publications of articles and reviews, in which two authors worked, a human profile and an AI profile. The idea of this quasi experiment was to find out if there is a big, small or no difference in the results related to Impressions, Clicks, Click-through-rate and SERP position, giving us a 'winner' in this race.

It is due to the rapid advances in AI and machine learning that research on this topic has had a significant increase. And it is due this speed of evolution of these digital systems, that even studies conducted no more than a decade ago, may be 'obsolete' in front of this type of content.

This study seeks to be part of an area that is still not very explored due to the novelty of the subject matter in question, together with the Digital Agency Bydas, from Porto. The structure of this research consists of:

The first chapter helps us to understand a little more the concepts of Artificial Intelligence (AI) and Search Engine Optimization (SEO), and how these are intertwined.

The second chapter deals with the methodology used for the study, what was the strategy for the search of information, the collection of information and the analysis of this information. Then, in the third chapter we will enter the space of the Digital Agency Bydas, and its disposition towards the use of Artificial Intelligence in the work environment.

The fourth chapter corresponds to the interviews conducted with the Bydas team. Finally, in the fifth chapter we will deliver the conclusions obtained through the interviews, conclusions of a blog created to obtain information regarding different areas of SEO strategies and techniques, in addition to containing the limitations of this study and suggestions for future research.

# Chapter 1

## 1. Literature review

### 1.1.- Artificial Intelligence

As technology and its application in AI have made great advances, doubts about what kind of work it can and cannot replace have led many to question its place and essentiality in society.

However, in the beginning AI seemed to have the characteristics to replace more logical tasks than creative ones. How true is this today?

According to John McCarthy (2004, p.2 ), in a publication made 20 years ago: *“It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence.”* A concept explained in 2004, whose reality is similar to today. McCarthy (2004) is in fact one of the pioneers in terms of the concept of AI, coining the word in 1956, becoming one of the great referents of the subject.

If we focus a little more on the last few years in which the subject is on the rise in terms of research and use, the concept is discussed more in terms of its possibilities to recreate human thoughts or reasoning. For example, according to Jiang et al. (2022, p. 9): *“While the AI systems of today have outperformed humans only in a limited range of highly specific tasks, there are still risks and concerns about a future when humans must co-exist with novel forms of AI systems.”*

Wolfgang Ertel (2024, p.1) highlights some questions regarding AI from a computer science point of view: *“The term artificial intelligence stirs emotions. For one thing there is our fascination with intelligence, which seemingly imparts to us humans a special place among life forms. Questions arise such as “What is intelligence?”, “How can one measure intelligence?”, or “How does the brain work?”. All these questions are meaningful when trying to understand artificial intelligence. However, the central question for the engineer, especially for the computer scientist, is the question of the intelligent machine that behaves like a person, showing intelligent behavior.*

*The attribute artificial might awaken much different associations. It brings up fears of intelligent cyborgs. It recalls images from science fiction novels. It raises the question of whether our highest good, the soul, is something we should try to understand, model, or even reconstruct.”*

Software tool’s like ChatGPT by OpenAI, Perplexity.AI or DeepSeek have access to millions of sources of information in milliseconds, and has learning and training capabilities, thus getting constantly better rationally and ‘emotionally’. By ‘emotionally’ we do not mean the ability to feel, but rather, to develop ideas and share messages in a more human way.

ChatGPT is an acronym for Chat Generative Pre-trained Tool, that is, a chatbot. While it is not the first chatbot ever created, it was after its November 2022 launch that the concept began to become much more popular among the public.

Shafik (2023, p.1), describes some of the main features of ChatGPT, pointing out *“ChatGPT, an advanced language model, has become a powerful tool in natural language processing (NLP) and AI (...) ChatGPT has acquired a deep understanding of language patterns, semantics, and context through extensive training on vast data. Its underlying architecture encompasses state-of-the-art deep learning (DL) techniques.”*

Perplexity.ai was launched in August 2022, before ChatGPT, and it includes a peculiar feature: its answers seek to provide truthful information. (When the user makes rational queries), Perplexity.ai’s answers are accompanied by a source, demonstrating that all information provided is real.

According to Shukla et al. (2024, p.13), *“The Perplexity AI model combines the features of OpenAI along with Google to provide quick responses to queries. This model utilizes OpenAI’s GPT-3.5 language model to facilitate text generation and up-to-date information.”*

Shukla et al. (2024, p.13) also argue that *“Perplexity AI aims to enhance the online search experience by offering more than just information. It searches the Internet for pertinent information using natural language processing (NLP) and machine learning (ML) to deliver answers to user requests.”*

DeepSeek has disrupted the AI market. Launched by the Chinese company with the same name (DeepSeek) *“it works with a programming model and architecture different from the rest, promising efficiency and speed, through lower cost (for developers) and requiring less ‘computing power’”* (James Vincent, 2025, p.1).

Ramet (2001, p.6) states that: *“Chambers Dictionary defines creative as ‘Having the power to create, that creates, showing, pertaining to, imagination, originality’ and writing as ‘The act of one who writes, that which is written, literary production or composition’. Therefore, the term ‘creative writing’ may be defined as: Having the power to create an imaginative, original literary production or composition.”*

McVey (2008, p.2) suggests that: *“any writing, from the published instructions for using a power drill to the most esoteric literary poetry, uses the raw materials of language, experience, knowledge, textual sources and the author’s own ideas and imaginings to bring something into existence that did not exist before.”* In other words, all writing is creative writing.

So, creative writing is not just for works of fiction that require the most ingenious minds. It is a process of ‘original creation’ which is adaptable to multiple fields of study.

According to Davenport and Mittal (2022, p.1): *“The creation of creative writing has: Improved content quality: AI-generated content can be of higher quality than content created by humans, due to the fact that AI models are able to learn from a large amount*

*of data and identify patterns that humans may not be able to see. This can result in more accurate and informative content.”*

The concept of originality is debatable because we can associate it only with a task that goes beyond logic. In other words, much of society could only relate originality to the human brain, the only one capable of inventing something 'from scratch'.

However, Machine Learning (ML) and the ability of AI programs to feed back on the interaction with users, puts us in doubt about their possible creativity. For example, today we can ask ChatGPT to create an image, giving instructions such as description, design, color, proportions or other, and it would be able to create it. Is this something creative or is it just a mix of logical factors capable of generating an image?

## 1.2.-Search Engine Optimization definition

According to Yalçõna and Köse (2010, p.2): *“Search engine optimization (SEO) is enabling a web site to appear in top result lists of a search engine for some certain keywords. (...) The most effective way to take attention of many users is connected with search engine optimization.”*

In other words, *“SEO helps increasing a website’s visibility within the search engines. This can be achieved by displaying the website on the first or second page of search engine results page (SERPs)”* (Parikh, A., 2013, p.1).

Going back to creative writing, it's not just about writing fiction. It is the writing of literary works, political speeches, blog articles, philosophical questioning or content creation for marketing campaigns. Tasks that until just a few years ago could only be attributed to human intelligence, are today a task performed by artificial intelligence platforms.

The results can obviously vary between right and wrong. As an example, if today we ask ChatGPT: *“in which work areas do you perform best?”* Its answer is: *“Customer Service, Marketing and Communication, Software Development and Technology, Education and Training, Human Resources, Consulting and Data Analysis, Health and Wellness, Legal and Compliance, Finance and Economics, and Creativity and Design (...) My ability to process and generate text quickly and consistently is a key advantage in many of these fields.”* (OpenAI (2024). ChatGPT 4o mini, November 21 version).

## 1.3.- AI and SEO

We could already be at a point where the capabilities of a human in the creation and application of SEO strategies and tactics are surpassed by the 'skills' of an AI.

Due to the recentness of this topic, there are not academic references regarding this matter. However, this study investigates and tests the results of an AI tool in the context of SEO, obtaining inferior, similar or superior results than a human.

It is predicted that those articles made through ChatGPT's customized profile, will obtain better results, as it was mentioned above, to aspects of the first interaction between site - user, highlighting in SEO techniques.

What the 'theory' suggests is that AI tools are likely to get a higher reach and conversion rate. By following established writing standards, its writing language will be more 'precise', getting scanned and 'read' easily by search platforms. This, in turn, will allow AI tools to appear in more related searches, being as 'SEO-friendly' as possible.

This research seeks to confirm that, despite the remarkable advances and the unstoppable evolution of technology in terms of systems and/or programs with Artificial Intelligence, these may obtain better results in the relationship between 'content creator' and 'user' in their first interaction, however, these results will be overshadowed in front of human creative expression, either in aspects such as reading time of articles, creation of personalized content, creation of web campaigns, content planning, among others.

Due to the speed of search, access to millions of sources, search personalization and other Machine Learning related skills, Artificial Intelligence -based software will be able to create algorithmically appealing content for search platforms, social networks and others. Will their final results be superior or inferior to a human?

This research seeks to prove that, despite the rapid and amazing advances in Artificial Intelligence and its use for better SEO techniques, these are overshadowed by a human creative profile. The research adds to the numerous investigations that are currently being carried out, due to the high 'demand' for the use of AI-based tools, which have generated multiple doubts regarding: Will the 'human' tasks in terms of creation be replaced by AI software? Or is this already happening?

The hypothesis of this research is that, although the advances of artificial intelligence, it still does not have the ability to mimic 'human creativity' at its fullest. Yes, it is capable of challenging human work in terms of writing, with certain advantages such as having access to millions of sources in a matter of seconds, in addition to having the ability of Machine Learning that allows it to 'learn' with each interaction, however, the 'human touch', seems not to be reached yet, what could be the meaning of a complete different result.

As formulated above, the question of whether or not we will be 'replaced' by Artificial Intelligence systems is the basis of a significant part of current research, which questions the continuity of people/professionals/employees in certain areas related to different work areas, from advertisers who are used for the creation of content at different levels, to programmers capable of creating complex programming source codes.

While this seems to be something 'utopian', it is not far from the reality experienced in the XVIII century through the Industrial Revolution, which gave way to hundreds of workers who performed work 'by hand', were replaced by machines, something unthinkable and, above all, not anticipated for that moment.

We can even see the enormous evolution in recent decades, where companies such as Amazon have warehouses that require less and less human interaction.

These are just examples of how technology has been adapted to the demands of the market in terms of labor costs, to not only make more profit, but to streamline processes, thanks to which today, there can be machines working 24 hours a day, 7 days a week, producing much more than a single person.

This is how the term 'The Fourth Industrial Revolution' (also called Industry 4.0) coined by Klaus Schwab, president and founder of the World Economic Forum, took great relevance in terms of a radical change in the functioning of society at the level of technology, professional work, jobs and much more. It would be Klaus who would point out:

*Mindful of the various definitions and academic arguments used to describe the first three industrial revolutions, I believe that today we are at the beginning of a fourth industrial revolution. It began at the turn of this century and builds on the digital revolution. It is characterized by a much more ubiquitous and mobile internet, by smaller and more powerful sensors that have become cheaper, and by artificial intelligence and machine learning. (Klaus S., 2016, p.11.)*

Ethics has played an important role in this era both for the creators of platforms, systems or software with artificial intelligence, as well as for their users. It is this issue that has led to multiple questions. On the one hand: How intelligent should AI be? Do we mix reasoning with emotionality? Is it the right thing to provide inaccurate information, as long as it is the fastest answer in the 'market'? Should privacy clauses be applied?

On the other hand, from the user's point of view: Can I ask anything? If I am afraid of being replaced by it, should I refuse to use it? Will it be my replacement in the future? Is the information it gives me real? Should I review the information given by an AI?

We must consider that AI, to which the 'public' has access, is something recent and has been advancing rapidly, which means that its regulations had to adapt quickly to them, rather than being created beforehand as a preventive measure. These regulations have been and continue to be questioned and even criticized, due to their low control.

Huang (2022, p.2) referred to this, stating: *“Even though AI ethics has been extensively discussed by interdisciplinary researchers for several years, it is still in its infancy (...) there is still a lack of comprehensive reviews to provide a full picture of this field.”*

## Chapter 2.

### 2.- Methodology:

#### 2.1.- Case study

Since most of this study focuses on data and information obtained from interviewees and a blog provides 'numbers' and quantifiable variables. This study is thus a case study with both qualitative, and to a lesser extent, quantitative data.

For data collection, structured interviews were conducted, whose five participants belong to the Bydas Digital Agency. These interviews allowed the exploration of their points of view on AI applied to SEO.

The structure of the interviews was based on nine questions on different topics related primarily to the use and application of AI, along with certain topics related to SEO. Since not all the interviewees work directly in these strategies, the 'space' was given to relate the topics to their respective areas of work.

After the interview, all interviewees signed a consent form (Appendix 1). The standardized interview guide is available in the Appendix 2. The transcript of the five interviews conducted in this study are available in the Appendix 3.

The topics addressed in the interview were the following:

- First impact of AI at a personal and work level.
- Software tools most used.
- Obstacles to using AI programs.
- The possibility of being replaced by an AI in the workplace.
- Opinion regarding the results delivered by AI systems.
- Concern about private information shared in these software tools.
- Support or rejection of AI systems.
- Possibility that the 'creative' results of AI may devalue human labor.
- Missing pieces for AI tools to be perfect.

The interviewees are specifically employees of Bydas Digital Agency. For the contact process, we spoke directly with the CEO of the company, who collaborated both with his participation, the employees one's and even let me use his space, so the interviews were conducted personally in his office in Porto.

Due to the fact that topics such as Digital Marketing, SEO or Artificial Intelligence, move around certain technicalities in terms of language, it was considered that there could be an obstacle that not everyone wanted to answer the interview in English, so the interviewees were given the option to answer the questions in Portuguese, native language of all employees in Bydas Digital Agency.

The language of the interviewer, i.e. my language, is Spanish, so I prepared myself as best as possible to ask the questions in both English and Portuguese. However, since I do not have an advanced knowledge of Portuguese, the possibility of asking counter-questions in this language was limited. Similarly, the questions were given on 'paper', so that the interviewees could be sure of the purpose of each question.

Interviews ranged from 15 to 35 minutes. All interviews had to be conducted on the same day, Friday 7, 2025, so I tried to take advantage of everyone's time to get as many interviews as possible. The Consent Form was given to each participant to be signed after the interview, in order to obtain approval for its use for academic purposes.

The interviews that were conducted in Portuguese (3) required translation and then transcription. The interviews conducted in English (2) only required transcription.

In total, five interviews were conducted with Bydas Digital Agency Employers and Employees. They were consulted regarding their vision on aspects and uses of AI in tasks related to different work areas. The interviewees included the CEO (Chief Executive Officer), the COO (Chief Operation Officer), the Content Creator and two Programmers/Web Developers.

Although the questions were focused on SEO techniques and their connection with AI, the interviewees were given the opportunity to openly express their use of AI in other tasks related to their areas of expertise.

Through interviews, we explored the vision of professionals involved in work directly or indirectly related to SEO, namely creative writing or other areas. We also explored how they use AI tools in some, several or none of their daily tasks.

The interviews were transcribed by an AI transcription software called Cockatoo, and structural coding was applied in order to follow a predetermined structure and hierarchy of questions.

## 2.2- Blog experiment

In addition to the case study, a blog was created in order to compare results between two profiles/authors, corresponding to a human profile and an AI profile, both article writers. In particular, we created a 'blog' format website, with articles contributed by a human profile and an AI profile, in order to analyze who would be able to obtain greater reach according to different factors.

Click-Through-Rate (CTR) figures will be analyzed, which measures, in simple words, how many users clicked on an article after seeing its Meta Title and Meta Description. The CTR were obtained by taking the total number of clicks, divided by the number of impressions, finally multiplying the result of this operation by 100, as shown in the image below.

$$\text{CTR} = \frac{(\text{Clicks})}{\text{Impressions}} \times 100$$

### *Figure 1: Click-Through Rate formula*

To execute the blog experiment, we created a website in blog format called Oddtakes.com, with the aim of becoming a site of articles on the subject of 'Rare or bizarre products and objects that you can find and buy on the Internet'.

The 'virtual space' was carried out thanks to the Bydas Digital agency, which bought and granted the domain for the realization of this experiment.

For the blog, a custom profile was created in ChatGPT, with certain instructions through a prompt with a lot of details, in order to get the best type of content, according to ChatGPT capabilities.

In order to obtain this statistical results, the experiment was conducted for a period of approximately 4 months (October 2024 to January 2025). It consisted of a thematic niche blog, in order to explore the differences in performance and results between humans and AI.

A niche theme was chosen, in order not to compete against the hundreds of sites with the most popular themes (Technology, Fashion, Lifestyle) and to be able to compete with other similar sites in the Search Engines, such as Google or Bing.

The site was divided in 4 sections:

- Technology
- Appliances
- Crafts
- Gifts

All articles were published in English, in order to achieve a greater reach.

For its growth, a daily publication was made on business days (Monday to Friday) from September 16, 2024, until January 31, 2025 (4 and a half months approximately). However, due to the indexing requirements of a web site, the site was only registered on Google and Bing since October 2024.

Initially, only organic movement was made in order to find an audience in a 'natural' way. Using Google Analytics and Google Search Console, we were able to obtain different data in terms clicks, impressions, CTR and position (Appendix 4).

The purpose of this was to be able to register and measure which users entered certain publications and which ones were more effective.: The titles and publications created by AI or those created by a human.

For the publications created by AI, it is worth noting that not only the main text is AI-based, but also its Title, Meta Title, Meta Description, Meta keywords and the title posts for publications in Social Networks.

Social networks such as Facebook, X (formerly Twitter), Substack, TikTok and BlueSky were also used. Due to both the format of publication and the greater reach possible in

accordance with a blog, a daily publication was maintained on Facebook and X only. The others were used for movement, interaction and publication on a random basis.

The topics to write about were chosen randomly, i.e. there was no thematic preference between human and ChatGPT. I, as the 'human profile', created a list of products to publish according to the theme of the blog, and these were randomly assigned to the two profiles (human and AI).

The site also has some features such as “featured articles”, articles that are randomly chosen by the editor, in order to promote “internal movement” of users within the website.

In the first period of 2 months, the growth and movement of the site, was done completely organically. The second period a paid campaign was applied through Google Ads, in order to speed up the growth of the blog. To make this as “natural” as possible, the campaigns were carried out at the minimum payment required for promotion.

The campaigns only redirected to the home page of the blog, which means that the reading of any particular article was not promoted. That way, none of the two profiles benefited.

Figure 2 and Figure 3 depict some of the images that were used:

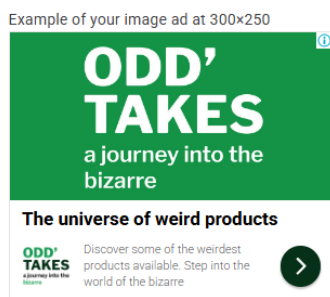


Figure 2: Oddtakes Campaign

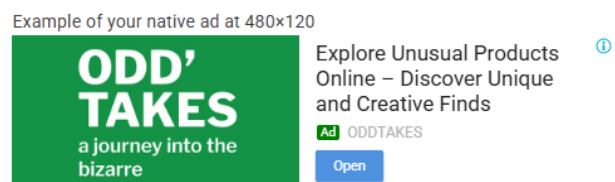


Figure 3: Oddtakes Campaign

The site also had some features such as “*featured articles*”, articles that are randomly chosen by the editor, in order to promote “internal movement” of users within the website.

The custom ChatGPT profile was asked to use the following instructions:

-The Structured Blog Writer focuses on crafting well-structured, formal blog posts aimed at attracting new audiences. Content is organized with clear sections, uses targeted keywords for SEO, and adheres to formal language conventions.

The writer prioritizes clarity and precision, ensuring each post is easily navigable with optimized formatting, including headlines, subheadings, bullet points, and concise paragraphs. The tone is formal yet approachable, with a focus on engaging readers through informative content while strategically incorporating keywords to reach new readers. It adapts blog formats for modern SEO practices, integrating metadata, keywords, and audience-centric formats like 'how-to' guides and lists.

For the creation of articles and reviews as accurate as possible, a custom ChatGPT prompt was created. This was:

1. If is asked to write an article about a given subject, the Blog Writer should write an article with a title, description, introduction, development and conclusion. The 'development' section should always be longer than the other sections. Add the shared link in some relevant part of the conclusion.

2. If asked to write a review about a product, after receiving the link, the Writer must create a review to the product with title, description and main text divided in 3 sections; those 3 sections will be why was this product chosen with a title 'why did we choose this?' ; what does this product do, with a title 'what does it do?'; and finally, why should people buy it or not with benefits and cons with a title 'should you buy it?'. The section 'what does this product do' must be longer than the other 2 sections. Add the same shared link in some relevant part of the section 'should you buy it?'.  
“In the first case (1.), an article about a subject...

The output must be in JSON format and presented inside in JSON snippet and the parameters will be:

- "text" - the body of article formatted with html tags (<p> for paragraphs, <strong> for bolds whenever a word is important for the context, <em> for italic whenever using foreign words or scientific citations, <blockquote> whenever there's a citation, <u> for underlines whenever there's a need for highlighting some concept. The text must have at least 4000 characters including html tags and each title of articles needs to be in H2;

In the second case (2.), a review about a product...

The output must be in JSON format and presented inside in JSON snippet and the parameters will be:

- "text" - the body of review formatted with html tags (<p> for paragraphs, <strong> for bolds whenever a word is important for the context, <em> for italic whenever using foreign words or scientific citations, <blockquote> whenever there's a citation, <u> for underlines whenever there's a need for highlighting some concept. The text must have at least 4000 characters including html tags and each title of reviews needs to be in H2;

Although the Oddtakes site is both an article and a review site, the use of articles was prioritized due to its wider reach.

Perhaps it is relevant to mention that the human profile (me) is a Journalist, so it has certain knowledge in terms of writing, spelling, editing and the area itself, creating articles, so the battle should be a little 'fairer'.

## Chapter 3

### 3.- Case

#### 3.1 Bydas Digital Agency

Companies around the world are looking for ways to fit aAI systems to their needs. Creative writing, content generation, ad campaign creation and even economic projections.

Bydas, a digital marketing agency based in Porto, Portugal is no stranger to the case. First of all, here are some key points regarding their specialties and areas of expertise.

Bydas specializes in various digital marketing services, including:

- Website and e-commerce development, with expertise in Shopify.
- Digital marketing strategy and management
- Branding
- SEO (search engine optimization)
- Google Ads and PPC (pay per click) advertising
- Social media marketing and advertising
- Analytics and data analysis
- Web design.

Most of these tasks mix rational (technical information) as well as emotional creative factors.

Bydas agency is no stranger to the use of SEO techniques or strategies, as it is not only one of its specialties when working together with other brands. The same techniques are applied for its self-promotion in search engines such as Google or Bing, improving every day and positioning itself in the first pages, organically.

Bydas Digital Agency specializes in different services, which requires constant adaptation to technology. Bydas Digital Agency does not prohibit the use of AI tools but rather promotes them.

This study includes an “inside” view of the Bydas Digital Agency, questions arise due to the ethics employed in daily tasks and the use of AI software. Do originality, authenticity and connection with users/clients empower Bydas or weaken it?

There are tasks that require the use of human creativity, but others seem to be 'replaced' by systems such as ChatGPT, either for efficiency in terms of speed or simplicity. Answering an email, a simple information search or a topic recommendation for content creation seem to be some of the basic tasks assigned to ChatGPT. Still, this calls into question, not the quality of the work, but the 'human' connection.

## Chapter 4

### 4.- Discussion

#### 4.1- Interviews

As we have already mentioned, this study seeks to answer the question ‘How artificial intelligence influences search engine optimization?’

There are several ways to measure the effectiveness of SEO, because depending on what the objective of the strategy is, you could be looking to rank on search platforms such as Google, you could be looking for conversions between Impressions - Clicks, sell 'your brand', generate traffic to a website or get new users to a particular web page.

The interviews point to some of these themes, however, each interviewee adapted their answer according to the area or task they are involved in on a daily or larger scale.

The CEO position is notorious: support and encouragement for the use of AI. Bydas Digital Agency provides a space where the use of this software is encouraged, but it warns that AI is not capable of surpassing human creativity.

*I think this is a great opportunity for us to have AI executing processes that are very analytic...the probability of the AI doing well is high, so we can focus more on creating content, illustrations, good texts, everything that a human should do. And the AI is only, for example, for reviewing.*

#### **CEO.**

This has a positive relationship with the research, in which most of the authors mention how certain human tasks have been or are being replaced, however, still at a complementary level as a tool. (Jiang et al. 2022, p. 9.)

Regarding the first impact produced by the arrival of systems such as ChatGPT, the responses are similar not only to each other, but to what many of us probably feel: How good is it? Will it really work? How limited are its capabilities?

All this in a tone of amazement, as these types of systems were quickly positioned, either through news, web portals, social networks and even through 'word of mouth'.

*The first glance, the hype, when people started talking about it, at the beginning I was shocked with how effective it works on chatting with us, explaining and giving all those answers, but then obviously I try to understand how this could be good for me, to try to find a way of working with it, and the impact on my work, directly on my work, and then I try to find ways of working with it in my company, obviously, I understand it as a challenge and something that can help me too in my business.*

#### **CEO.**

The 'hype' that many probably felt led to the curiosity to try these software's (and that continues to be generated in new users), and in this way, many wanted to test all the skills and capabilities of programs like ChatGPT.

In this case, we see how AI took many by surprise and many wondered what might be the best way to use it: helper or replacement? (Shidiq., M. 2023, p,1).

Of course, it was also necessary to know which programs are most used by the interviewees. At this point, it must be a significant group, those who directly associate IA with ChatGPT, being that there are hundreds of thousands of software with the same or similar capabilities

*We have OpenAI and we pay for OpenAI for the API and for a ChatGPT, so there are two tools, and we have a plus account for ChatGPT that helps my team to ask questions about, you know, a lot of things, for example, budgeting. For example, we did some changes in our way of making on the budgets and ChatGPT helped us doing, you know, implementing industry standards and things like that. So, a lot of things can help me to manage the company, helping development projects, a lot of things.*

#### **CEO.**

In order not to cite all the interviews, all participants responded that they only used ChatGPT or at least, it was the one they used the most, which demonstrates the massiveness and preference of this AI, compared to others, which is how the structure and dynamics of ChatGPT has become the tool, by a large majority, associated with just hearing the concept of 'AI'. (Shafik, W., 2024, p.2).

The use of these technologies has not become widespread without obstacles. There have been multiple experts from different areas who have warned of obstacles, ranging from inaccurate information to the lack of 'human touch', however it seems that the skills of these programs have improved, at least from the point of view of some.

*I think the biggest obstacle is for people to think that the content isn't going to look like it's from a human, it's not going to look personal, it's not going to look like someone wrote it (...), I don't think so, I think it's been improving. Even the way in which AI responds to explaining concepts and giving that information has improved, because at the beginning AI responded a lot to the concept itself and then you always had to question it a bit more and a bit more until you had the information you wanted, and now AI is already doing that job, so to 'speak', it's moving on a bit more in that case.*

#### **COO.**

Here we can see an opinion regarding a notorious advance, because although many users still consider that AIs lack a certain human touch, a question arises that anyone can ask: How much content generated by Artificial Intelligence programs have I consumed without knowing it? What if this produced material already seems natural and we are not able to tell the difference?

There are certain texts, images and even videos that make us doubt their veracity, because only two years ago it was easier to recognize material created either by humans or by AI, this has become increasingly difficult, due to the quality of material created by AI.

ChatGPT has been increasingly incorporated into 'human-like' work tasks, even if it lacks that little touch, its 'generate human-like' language brings it closer and closer to our own abilities. (Shafik, W., 2024, p.2).

The question then arises as to how much of our work is really replaceable or 'doable' by an AI. If we put it as a percentage, what would be the reader's first answer? 0%? 50%? 99%?

Something difficult to answer, but which leads us to weigh our capabilities against those of an AI.

*Genuinely, I don't think everything I do can be done 100% by AI yet. I don't think anything I do can be done by AI. Because there you have it, you need the human hand, the AI, no matter how great the description and how precise it is of what I'm going to write, of my input, it's never going to do something like I'm thinking or imagining. It has a lot to do with content creation, it plays a lot with creativity.*

### **Content Creator**

From the point of view of fully creative work, the answer is clear. 'What I do cannot be done by an AI', it is better to note the 'yet', considering that this might not happen yet, however, it seems to be a reality not too far away.

On the other hand, considering a much more technical/rational work, the answers are different.

*Maybe 15%, 20% of my work will be irreplaceable because it's that thing of asking me to do this or asking me to do the rest, I think I can do everything. Maybe in a while programmers, those who manage to create an AI focused on a project and focused on technology, will probably be the future programmers. Instead of programming code, they are going to program an intelligence that does the work for them, almost automated.*

### **Programmer/Web developer 1**

With the same sincerity and clarity in their field of work, the answer here is 'almost opposite', as these types of tasks require less creativity and more rationality and memory. It is here, that Machine Learning skills have a huge advantage in multiple factors: memory, speed, efficiency at the level of economic resources, among others. However, in the face of the creativity factor, it seems to fall short, which contradicts some of the research. (Shukla M., Goyal I., Gupta B., Sharma J., 2024, p.12.)

In relation to the same topic, we must understand that many essential tasks can be requested to programs such as ChatGPT and thus obtain a quick result or response. However, the ‘human hand’ has the responsibility and / or need to appreciate the value of these responses, rating it as inferior, equal or superior in terms of level of ‘quality’.

Not only does this have to do with what tasks an AI can perform best at, but also our instructions play an important role in this task. In particular, the more specific the ‘prompt’ requested, the more accurate the response can be.

When consulting with respondents, they were asked to answer honestly about the level of quality of a task performed by an AI versus the level of quality of themselves.

*It depends on the topic (...) if we’re thinking from the point of view of asking the AI to write us something, an e-mail for something or an explanation, something like that, they’re superior.*

*The AI will always take into account some detail or some feature that I might miss. But sometimes when we want the AI to give us results, sometimes of more recent information or how we can structure that information or things like that, the AI doesn’t always have the most up-to-date information, or it doesn’t always answer what we were asking.*

## **COO**

On the one hand, our memory could play a ‘trick’ on us, leaving out some detail in terms of information, writing, wording or other, in terms of relatively ‘simple’ tasks such as answering an email. Similarly, it is detailed how the first interaction between machine-users requires as many details and instructions delivered, in order to obtain the best possible result. The quality of content is a crucial factor, and in this case, as through research, AI has many advantages, allowing it to generate positive results, albeit sometimes sacrificing other crucial factors such as ‘human touch’ or accuracy. (Rathore B., 2016, p.2.).

Just as AI can be used for ‘good’, many fear that it can be used for ‘evil’. At first glance, it would seem that the use of these tools does not require personal information from users, however, with the ability to access millions of sources of information or the simple fact that further access to tools through subscriptions requires banking information from the user, questions have arisen as to ‘where’ and ‘how’ this private information is stored. Can hackers access it? How secure is my information?

*Possibly, if it can’t already, it will soon be able to hack something and possibly also extort personal information, such as passwords, bank details, because AI is a machine, it does what it has been programmed to do. It doesn’t act ethically. We have to think that AI also has to be regulated on ethical principles. It can’t be made to do what a person tells it to do. There has to be a limit to AI.*

## **Content Creator**

The fear seems to be closer to the management of people like Data Brokers or even hackers, in terms of AI systems, that although these types of people are not a new threat, if they could now have access to a new tool, capable of facilitating these undesirable or even malicious processes.

This confirms what some authors highlight the possible risks that a person could cause (through an AI), compromising personal information, private data or others. (Huang., 2022, p.2)

While AI systems seem to have advantages and disadvantages, it is up to the user to decide whether to use it or not, and under what kind of tasks. It is here that other types of doubts arise: Can I or should I use AI in order to obtain quick results, and at the same time be against its development? Am I in favor of its development, even if it can be my 'replacement' in the not-too-distant future?

Respondents were asked whether they supported or were against both the development and use of AI software.

*It seems kind of controversial at what I'm telling, because at the start I was just saying 'they are like the worst'. But this, I'm talking as trying to replace myself, right. Trying to replace what I do. These, for sure, nowadays it won't occur, it's impossible, but for small stuff, for boilerplates as I already said, like these, they are really good, they can provide you at least a tip, what you can do or what you can fix.*

*So, they are really great. They usually have a point of view that you probably won't have and would like for sure to help you do something. So, I fully accept it.*

## **Programmer 2**

By consulting with the CEO of Bydas Digital Agency on this topic, we can understand not only his personal view of its use, but also his perception of the advantages that AI can offer his agency:

*I think after saying what I said, I think it's clear. I'm totally open and in fact I hope to improve a lot of processes with AI. Obviously, at this moment in my company, one thing that I want to change is the way, focus less on processes and more on creating content. Not AI creating content. It's exactly the reverse. People think that AI is good for creating content.*

*But I think this is a great opportunity for us to have AI executing processes that are very analytic. The probability of AI doing well is high, so we can focus more on creating content, illustrations, good texts, everything that a human should do, and the AI is only, for example, for reviewing.*

## **CEO**

We can see a positive reception, due to the benefits that can be obtained with AI, which today would not be reflecting a threat in the day-to-day work, but rather, an advantage. This confirms some of the research, regarding the use of AI as a tool rather than a replacement (at least for now). (Boden M., 1998, p.1.)

There are many doubts today regarding the supposed creativity of AI's. How capable are they of creating something 'original'? The creation of images and videos with AI has been a huge surprise to the world, due not only to the quality of these, but also to their rapid evolution, being increasingly difficult to detect whether a photo is real or artificially created.

So, could the results created by AI be so wide-ranging and innovative that they make human creative work 'unoriginal' or 'simple'?

*No, I think it's an opportunity. I think AI will help a lot of people to generate a lot of content easily, quickly but will be always with the same standard framework, let's say that way, and will give us the opportunity to start creating more things outside of the box.*

### **CEO**

The CEO's vision shows that this is an opportunity, due to the restrictions of the AI systems themselves, because they always have a limit (even in the millions) on how much information they can crossover for creative work, which confirms the research as to how dependent an AI is on prompts and instructions delivered by the user. (Davenport., 2022, p.1)

By the end of the interviews, the participants were asked about their opinion regarding what is 'missing' in AI applications to become the 'perfect tool'. Here we want to know the opinion of different areas and not only work, but even on a personal level.

*I think it's probably the human side that's going to be lacking and I think it's always going to be lacking in the IA, because I can ask him something for one store and ask exactly the same thing for another store and he'll give me the same answer, but I believe that the human side of looking and seeing the end product is going to make the difference*

### **Programmer/Web developer 1**

The answer addresses an unsurprising issue: What AI lacks is the human touch. Will it be able to achieve it or will it be an eternal differentiator between machines and us?

*What would the AI be missing because when I ask it something, the AI already answers me (...) But I don't want the AI to have a human touch either. We'll leave that to 'you', I don't see AI as... I know that AI is being used a lot in creation. There's copy, descriptions, texts and all that, but I don't think it needs to have a human touch. I think things should always be afterwards.*

### **COO**

While here we can also see that the human touch is something that AIs are not yet able to achieve, it is also seen reflecting the desire for this not to happen. 'The rational for machines, the creative for humans' to say one way or another, which is positively related to research suggesting that for now, the human touch is the big differentiator between AIs and 'the man'. (Davenport., 2022, p.1)

## 4.2- Blog Experiment

As for the blog experiment, we will expose the results in order to know at an empirical level, the winner of the SEO battle between a human and an AI.

As mentioned before, here we will expose the impressions and clicks, in order to obtain the final CTR of the most outstanding articles on the site. The SERP position of these publications will also be included and the results of 'the winner' will be delivered.

The figures will be exposed according to the performance in Google Search Console, Google's platform that allows us to observe, measure or correct the appearances of a website in the search engine.

Although the website has a high number of publications, only those that have obtained at least 1 click will be displayed, in order to obtain a CTR above 0% (1% upwards).

#### 4.2.1.- Queries

Author	Main Queries	Clicks	Impressions	CTR	Position
AI	Chilloza	7	45	15,6 %	2,8
Human	Casio cpp-002 sauna	2	3	66,7 %	8,7
AI	Squid game crocs	1	31	3,2 %	37,5
AI	Spicerr	1	29	3,4 %	8,8
Human	Pepsi ring bad gyal	1	12	8,3 %	3,8
Human	Casio cpp-002 price	1	8	12,5 %	8,4
Human	Casio cpp-002-bk	1	6	16,7 %	8,7
Human	Casio cpp-002-or	1	6	16,7 %	8,8
Human	Cpp-002-or	1	6	16,7 %	11,0
AI	Smart spice dispenser	1	3	33,3 %	6,3
AI	Bwd high mschf	1	1	100 %	8,0
AI	Moschino giant celery bag	1	1	100 %	10,0
Human	Petit pli	1	1	100 %	67,0

*Table 1: Google Search Console Queries*

#### 4.2.2.- Pages

Author	Main Queries	Clicks	Impressions	CTR	Position
Human	<a href="https://www.oddtakes.com/en/technology/the-new-creation-of-the-giant-casio">https://www.oddtakes.com/en/technology/the-new-creation-of-the-giant-casio</a>	13	260	5 %	8,9
AI	<a href="https://www.oddtakes.com/en/gifts/chilloza-the-sweet-revolution-without-the-calories">https://www.oddtakes.com/en/gifts/chilloza-the-sweet-revolution-without-the-calories</a>	8	46	17,4 %	2,2
AI	<a href="https://www.oddtakes.com/en/appliances/spicerr-the-ai-powered-smart-spice-dispenser-revolutionizing-kit">https://www.oddtakes.com/en/appliances/spicerr-the-ai-powered-smart-spice-dispenser-revolutionizing-kit</a>	3	69	4,3 %	14,0
Human	<a href="https://www.oddtakes.com/en/crafts/pepsi-ring-long-life-to-your-nails">https://www.oddtakes.com/en/crafts/pepsi-ring-long-life-to-your-nails</a>	3	31	9,7 %	4,5
AI	<a href="https://www.oddtakes.com/en/gifts/squid-game-x-crocs-classic">https://www.oddtakes.com/en/gifts/squid-game-x-crocs-classic</a>	2	82	2,4 %	38,9
AI	<a href="https://www.oddtakes.com/en/gifts/adidas-rasant-mid">https://www.oddtakes.com/en/gifts/adidas-rasant-mid</a>	1	20	5 %	8,2
AI	<a href="https://www.oddtakes.com/en/technology/garrison-bespoke-bulletproof-suit-review">https://www.oddtakes.com/en/technology/garrison-bespoke-bulletproof-suit-review</a>	1	13	7,7 %	7,9
AI	<a href="https://www.oddtakes.com/en/gifts/mschf-bwd-high-review-a-bold-take-on-footwear-fashion">https://www.oddtakes.com/en/gifts/mschf-bwd-high-review-a-bold-take-on-footwear-fashion</a>	1	11	9,1 %	26,2
Human	<a href="https://www.oddtakes.com/en/gifts/discover-the-new-line-of-mcdonald-s-scented-candles">https://www.oddtakes.com/en/gifts/discover-the-new-line-of-mcdonald-s-scented-candles</a>	1	7	14,3 %	7,4
AI	<a href="https://www.oddtakes.com/en/gifts/moschino-s-4-995-celery-bag-a-high-fashion-statement-blurring-li">https://www.oddtakes.com/en/gifts/moschino-s-4-995-celery-bag-a-high-fashion-statement-blurring-li</a>	1	5	20 %	8,6
Human	<a href="https://www.oddtakes.com/en/gifts/this-book-still-has-readers-confused-satire-or-hate-speech">https://www.oddtakes.com/en/gifts/this-book-still-has-readers-confused-satire-or-hate-speech</a>	1	4	25 %	10,5
Human	<a href="https://www.oddtakes.com/en/gifts/how-much-would-you-pay-to-breathe-clean-air">https://www.oddtakes.com/en/gifts/how-much-would-you-pay-to-breathe-clean-air</a>	1	3	33,3 %	7,0
Human	<a href="https://www.oddtakes.com/en/gifts/the-perfume-with-the-mysterious-and-sinister-aromas-inspired-by">https://www.oddtakes.com/en/gifts/the-perfume-with-the-mysterious-and-sinister-aromas-inspired-by</a>	1	3	33,3 %	7,0
AI	<a href="https://www.oddtakes.com/en/technology/protoncaster-a-peculiar-blend-of-music-and-ghost-busting">https://www.oddtakes.com/en/technology/protoncaster-a-peculiar-blend-of-music-and-ghost-busting</a>	1	3	33,3 %	7,0
Human	<a href="https://www.oddtakes.com/en/crafts/your-secret-self-defense-tool">https://www.oddtakes.com/en/crafts/your-secret-self-defense-tool</a>	1	2	50 %	3,0
Human	<a href="https://www.oddtakes.com/en/crafts/discover-the-children-s-clothing-that-grows">https://www.oddtakes.com/en/crafts/discover-the-children-s-clothing-that-grows</a>	1	1	100 %	67,0

Table 2: Google Search Console Pages

The first table shows the 'Queries' section. Taking the total clicks, the AI profile got 12, along with 110 total impressions, while the human profile got 8 total clicks, along with 42 total impressions.

Author	Average CTR
AI	42,583%.
Human	33,942%

Table 3: Average CTR for the 'Queries'.

This first exhibit shows that the AI author obtained a higher number of total clicks and total impressions than the human profile, which would mean that the content generated

by the AI profile would be present in the search results with a higher frequency than the human.

As for the CTR of the AI profile, the total average of all queries is 42,583%, with the highest being 100% and the lowest being 3,2%, however, these may be 'misleading', as these that obtained 100%, were produced under: 1 click - 1 impression = 100%.

As for the human profile, this obtained an average CTR of 33,942%. The highest being 100% and the lowest 8,3%. Like the IA author, the CTRs of 100% are results of 1 click - 1 impression = 100%.

The second table shows the 'Pages' section. Taking the total clicks, the AI profile got 18, along with 249 total impressions, while the human profile got 22 total clicks, along with 311 total impressions.

Author	Average CTR
AI	12,4%
Human	33,825%

*Table 4: Average CTR for the 'Pages'.*

In the table referring to 'Pages', the 'human' profile is the one who got the advantage. The AI profile obtained an average CTR of 12,4%, with its highest figure being 33,3% and 2,4% the lowest.

On the other hand, the human profile obtained an average CTR of 33,825%, with the highest figure being 100% and the lowest being 5%. Again, the 100% figures correspond to 1 click - 1 impression: 100%.

Clicks:

Author	Total Clicks combined
AI	30
Human	30

*Table 5: Total amount of clicks*

Impressions

Author	Total Impressions combined
AI	359
Human	353

*Table 6: total amount of impressions.*

CTR

Author	CTR combined
AI	27,491%
Human	33,883%.

*Table 7: average CTR combined.*

By combining both data's, the picture becomes a little clearer, obtaining results with a larger sample, making it more reliable.

When added together, the final figures for total clicks and total impressions are much more similar between the two profiles. The AI profile got 30 total clicks, along with 359 total impressions, while the 'human' profile managed to get 30 total clicks, along with 353 total impressions.

Performing this combined calculation, we can obtain as final figures an average CTR for the AI profile of 27,491%, while for the human profile it would be 33,883%. Let's remember that the higher the CTR, the 'better' the results should be, however, we also have other variables.

Regarding the position in Google, considering both tables, the AI profile achieved the lowest position -i.e. a better position- of 2.2, being shown by Google in a good position with related searches. While the lowest position figure of the human being was 3.0. A figure with also good position, however, a bit further back than the opponent profile.

First table:

Author	SERP Position
AI	12.23
Human	16.63

*Table 8: Average SERP position first table*

Second table:

Author	SERP Position
AI	14.125
Human	14.412

*Table 9: Average SERP position second table*

SERP position tables combined:

Author	SERP Position
AI	13.31
Human	15.45

*Table 10: average SERP position tables combines*

## Chapter 5

### 5.- Conclusions

#### 5.1- Artificial intelligence and search engine optimization

The research question of this study is: How artificial intelligence influences search engine optimization? The interviews give results that seem to favor 'human' labor, positioning it as indispensable for the most part, to date. Everyone sees the tools with intelligence, to a greater or lesser extent, as just that, a tool. Something that helps them to perform certain daily tasks that require speed, and it is in the face of this challenge that the interviewees use AI tools, not because they cannot perform one of these tasks, but because the speed of AI programs is a complement with results that are not always perfect, but efficient.

As we can see in the interviews, there is one application that dominates over all the others, and we are talking about ChatGPT. We have small glimpses of other new applications such as DeepSeek, however, the software created by OpenAI, ChatGPT, is the one who takes the top prize.

This is something curious to highlight, because it is the same interviewees who mention not to trust the answers provided by this AI, because it contains flaws/errors in terms of information, not only at the level of 'information mix', but they have expressed the feeling that more than once they have received completely false information, as if it 'had been invented by ChatGPT'.

So far AI platforms, tools and other systems, seem to be here to stay. Is it better to adapt to them or refuse? It seems that the best thing to do is to find a way to take advantage of them in an ethical, correct and efficient way.

Each labor field (for the most part) can nowadays look for a way to take advantage of them. We know that, in a simple example, today an AI system does not replace a carpenter, however, there are many areas that can put these platforms to good use.

In digital marketing and in relation to the use of SEO techniques, the different AI systems can be leveraged to facilitate tasks and / or daily work challenges.

AI offers multiple advantages in terms of its use in digital Marketing. For example:

- Prediction and projections: AIs, having access to millions of data, able to cross-reference information and access relevant information histories in relation to each query, is able to create analytics and predict certain outcomes, whether for a campaign, for brand positioning or others.
- Automation: Simple but time-consuming tasks such as writing emails, titles and ideas for social media posts or searching for trending topics on the web.
- Post-content ideas: the task of searching regarding 'what to write', 'what type of post to create', or article or video creation ideas.

- User experience: improve the user experience either through automation, recommendations or AI 'correction' tools.

These are just some of the tasks that today can be easily and quickly given to AI tools.

From a slightly broader definition, author Bharati Rathore (2016) points out that AI solutions may provide website administrators with insights about their visitors by analyzing data points such as navigation pathways, page performance, user preferences, and intent.

By way of conclusion from the interviews, we can deduce that while the use of software, programs or tools with AI in Bydas, are used as a complement, which need the human touch to meet specific objectives, in order to ensure success either in SEO strategies and tactics, web campaigns, user experience, customer service and much more.

Regarding the blog experiment, do we have a winner?

The answer is somewhat complicated. If we consider only Impressions and Clicks, the AI profile would be the winner, because it would be generating a higher volume of traffic, which translates as more appearances in the search results (359 impressions, over 353), although the difference is very low.

So, considering impressions and clicks, the results of this experiment are not significantly conclusive. The AI profile obtained an insignificant advantage, however, in the final average CTR, the human profile would be the winner with a sample with more significant results.

If we consider the average CTR of both, the human profile obtains a greater advantage than the AI, obtaining an average of 33,883%, versus 27,491%. This would indicate that the content generated by the human profile would be more effective in incentivizing users to 'click' through more attractive titles.

If we analyze the average SERP of both profiles, the combined values for the IA author are 13.31, while the human profile obtained a 15.45. This would indicate that the content created by the IA profile would be more optimized for its appearance on search platforms.

Based on conversions as traffic generation, the main objective for the blog (it does not require conversions such as purchases or subscriptions), the best result would be the ones obtained by the human profile. With a figure of 33,8≈% versus 27,40≈%, we could say that the winner, despite being by a narrow gap, would be the human profile.

## 5.2.- Limitations

This study was conducted under the context of the Bydas Digital Agency, so its results at the interview level are a result of this specific workspace.

While it is not far from a 'general' field, where SEO strategies and tactics are used for different external agents/companies, its results may be limited in comparison to a larger sample, either across companies with even larger reach or with a larger team of people.

The sample expresses the views of each individual, which may also vary significantly with any other respondent.

As for the study conducted through the blog, its results are limited to the final sample in terms of 'numbers' and results. Here there may be limitations in terms of project duration, as well as the skills of the authors (AI and I included).

On the ChatGPT profile side, there are thousands of prompts or profile customizations that can be created and/or adjusted by users, which can mean both better or worse results.

On the human profile side, the basis is the same. Skills may be superior or inferior to other writers, so the same type of study, in another circumstance, created by another professional, may have completely different results.

Similarly, the literature is limited. While we have 'a lot' of information, there is little that demonstrates the current steps in the uses of AI, due to its enormous and rapid advances, which means that the accuracy of other research may be obsolete.

### 5.3- Suggestions for future research

A larger sample is always more meaningful, so whether through an experiment with longer duration in terms of 'time', with larger financial resources or simply with a different blog topic, a larger data collection, could create a larger difference between the 'winner' profile and the 'loser' profile.

Other information-gathering formats could also be implemented, such as online or face-to-face surveys with similar professional profiles.

### 5.4.- Practical Implications

The conclusions of this research give us a glimpse of how companies, agencies or brands can take advantage of AI tools. Neither should employers be afraid to encourage their use, nor should employees be afraid of the possibility of losing their jobs.



# Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of my written Final Master's Thesis, Perplexity.ai, ChatGPT and Cockatoo AI, were used for the following tasks:

-The Perplexity,ia tool was used to search for articles related to the topic of AI (example: Vincent, J. (2025).), under prompts as: “show me articles regarding the impact of DeepSeek in the AI competition”.

-ChatGPT was used, in the realization of the blog, as an Author and as a search tool for products related to the subject of the blog, following the prompts shown on page 17 of this document.

-Also, ChatGPT is a reference of this study, when consulted regarding “its potential capabilities”, mentioned on page 11 and in the bibliography. (OpenAI (2024).

-Finally, Cockatoo audio-to-text transcription software was also used, as mentioned on page 15, for the interview's translation.

After using these services, I reviewed and edited the content as necessary, and I take full responsibility for the content of the work presented.

I also declare that I am aware of and respect the Artificial Intelligence Rules of Conduct of Católica Porto Business School.

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# Appendices

## Appendix 1

Consent form

CONSENT FORM – Research study

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The following information is provided to ascertain whether you wish to participate in the interview for this study or not:

1. You may choose not to participate in the interview and are not obligated to answer any questions if you wish. This will have no impact on your relationship with the researcher José Encina J.
2. The purpose of this study is to know and understand better certain processes and tasks related to the use of Artificial Intelligence in creative environments. In order to understand and obtain various conclusions, interviews will be conducted with people in different positions such as CM, CEO or others in the company Bydas, in addition to an extensive literature review. The result will be used for a master thesis.
3. The fact of participating in this interview will help to be part of qualitative research to obtain a greater number of conclusions and points of view.
4. The conversation will be recorded, so as not to lose any details regarding your contribution to this study. The recording will only be listened to by the researcher José Encina J. and will be converted into a transcript in a Word document. Your identity will remain confidential.
5. Anything mentioned in the interview, as well as any summary information from the interview or excerpts from the interview, will be anonymized so that you cannot be recognized.
6. To our knowledge, there are no hazards or inconveniences linked with this research.

If you would like to participate in this interview, please sign in below.

Signature: \_\_\_\_\_

Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_



## Appendix 2

### Interview Guide

## INTERVIEW GUIDE

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### **Part 1:**

Adaptation in the use of Artificial Intelligence in the work environment:

1. How was the impact of AI deployed in your work, in its first look vs. now? (in SEO, Creative writing, or another if these cases do not apply to you.).
2. Do you implement any AI tools today to personalize content and/or user experience? (Which ones do you use and how do you use them)
3. What would you say are or have been the biggest obstacles in using AI software's? (for SEO, writing, design)
4. What percentage (approximate) of your work is irreplaceable by an AI 'today'? Either because the technology is not yet developed, or because the AI does it poorly (or another option).
5. Do you honestly believe that the results offered by AI are inferior, equal or superior to yours? (In SEO or other areas if this case does not apply to you).

### **Part 2:**

The advances and projections of AI softwares:

6. What are your thoughts on the possible loss of confidential information? Do you think this is something to worry about?
7. Do you welcome the use of AI with rejection or with full support onto your work? Why?
8. Do you think that due to the wide possibility of AI creations, people/professionals will suffer from creations labeled as 'unoriginal' or simple?
9. What does AI lack to be a perfect tool for SEO strategies/tactics? (or another task related to your field if it does not apply to you)

Signature: \_\_\_\_\_

Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_



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## Appendix 3

### Interview 1: CEO

1.- How was the impact of AI deployed in your work, in its first look vs. now? (in SEO, Creative writing, or another if these cases do not apply to you.)i?

The first glance, the hype, when people started talking about it, at the beginning I was shocked with how effective it works on chatting with us, explaining and giving all those answers, but then obviously I try to understand how this could be good for me, to try to find a way of working with it, and the impact on my work, directly on my work, and then I try to find ways of working with it in my company, obviously, I understand it as a challenge and something that can help me too in my business.

2.- Do you implement any AI tools today to personalize content and/or user experience? (Which ones do you use and how do you use them)

Well, in a lot of ways in my company. Obviously, creating content, reviewing content, helping solve issues from coding, for example, using also the API (Application Programming Interface) to automatically translate some content for other languages, for example, this is just a way of integration that we have with OpenAI.

We have OpenAI and we pay for OpenAI for the API and for a ChatGPT, so there are two tools, and we have a plus account for ChatGPT that helps my team to ask questions about, you know, a lot of things, for example, budgeting. For example, we did some changes in our way of making on the budgets and ChatGPT helped us doing, you know, industry standards, implementing industry standards and things like that. So, a lot of things can help me to manage the company, helping development projects, a lot of things.

3.- What would you say are or have been the biggest obstacles in using AI software's? (for SEO, writing, design)

Privacy is a big thing. Obstacles in this way, accessing for example. I'm very curious about DeepSeek, the Chinese one. I did some tests, very promising tests, but I don't feel comfortable working with it, maybe it's because it's Chinese and I know they don't care about some of the, you know, European standards, let's say that way.

Also, like maybe sometimes you have to be too specific. Or they are... The obstacles, yeah. So, in the operation of the AI, the obstacles, I think is more like, we never know what to expect from the answers. Sometimes there are some lags, sometimes we have problems with. We select a different model, a model that doesn't work the way we want.

So, you know, there are still a lot of challenges right now for the ChatGPT platform. In all the platforms there are big challenges to standardize, to have LLM models (Large Language Model) that are working well, very optimized with high speed answering.

For example, one of the things that operationally is not very good is asking something to ChatGPT and it gives you, you just need one word and it explains you everything. For example, deep seek is more focused on the answer and on the specifics of the answer.

ChatGPT goes around, around, around. So these are, I think everyone feels that the same way as me, no?

4.- What percentage (approximate) of your work is irreplaceable by an AI 'today'? Either because the technology is not yet developed, or because the AI does it poorly (or another option)

This is a big question. I think a lot of my work has to be done by me. I understand your point, here we are on the borders of the unemployment problem, probably for a lot of people, but I feel that, yes, there are some stuff that I can solve with sharp-shifty or whatever, but at the same time I have new challenges. How to train it, how to automate a lot of tasks.

So I, problems that I didn't have one year ago, now I have those problems. Yes, I don't have problems to go to my banking account or upload my banking account to ChatGPT so they can give me all the reviews of all the clients that paid me or not. ChatGPT can help in accounting too. I work with that too at this moment.

So it helps me a lot to have all my accounting organized. So yes, this is nice, so I don't spend a full morning working on that. But now I need to work on tools to train, to help ChatGPT to improve the way it detects the PDF that I share with it every month. So, I, for some time, touch a bit, but then I find new challenges.

So it solves me problems but gives me new problems to solve. It needs me, and I need it. No? I think it's like that. But it's probably the AI is more dependent on you than the AI.

I think the AI is dependent on the inputs I gave, obviously, because I need to train. If I have a new client, I need the AI to be aware that I have a new client. So, at the end, I can say it in chat, or if I have a flow in OpenAI and API, I can send the information about the new client. Obviously, these are automations, but someone needs to code these automations too.

With OpenAI or with ChatGPT, we can create more in less time, obviously. But my point is that it's not only the AI doing things and we are not doing anything, we are still doing other things. So we can provide the AI the best flows, the best information, so they can obviously produce the best answer for us. I think it's that way.

5.- Do you honestly believe that the results offered by AI are inferior, equal or superior to yours? (In SEO or other areas if this case does not apply to you).

In the search market, digital market, I think humans are better. But probably we don't, because of a question of productivity, we know that some of the tasks that we need to do can now be done with AI.

So, you know, we make some shortcuts. For example, we need to plan a campaign for search. We can go to the Google Keyword Planner and research for keywords. We can also ask for a ChatGPT. The first option will take us one hour and the second option will take us two minutes.

So the research is good. But then, obviously, we have the keywords, and probably we are doing... for example, planning for a client, and because we have the keywords taking only two minutes, we have more time to do a nice-looking budget for the client. So it's not necessarily, you know, the productivity improves, we find some shortcuts, some of the tasks we use information directly from the Chats UTP because some of the tasks we trust more than others. But this gives us the ability to have more time to focus on other things. For example, the way things are presented. Sometimes we don't have time to do a very beautiful budget with all the scenarios, the forecast for all the scenarios, but if we have time to change it, so they give us this more dark part of the work that is hard for us, no, because a lot of time, it's obviously good, and we can improve other things in our projects now.

6.- What are your thoughts on the possible loss of confidential information? Do you think this is something to worry about?

Yeah, yeah, yes, completely, obviously.

Yeah, I have this concern, for example, I have the chat GPT for the company, but I use it with my personal issues too. Sometimes I ask, even with my phone, with voice recognition, then I need to remove this because some people from my team will see this, okay, it's personal stuff. So, from this perspective, you know, with less importance to the other level of privacy issues. I think I already told you about the example of DeepSeek, I don't know exactly which kind of information I should share with the model, with the chat. I have some concerns there.

7.- Do you welcome the use of AI with rejection or with full support onto your work? Why?

I think after saying what I said, I think it's clear. I'm totally open and in fact I hope to improve a lot of processes with AI. Obviously, at this moment in my company, one thing that I want to change is the way, focus less on processes and more on creating content. Not AI creating content. It's exactly the reverse. People think that AI is good for creating content.

But I think this is a great opportunity for us to have AI executing processes that are very analytic, that can be very... The probability of AI doing well is high, so we can focus more on creating content, illustrations, good texts, everything that a human should do. And the AI is only, for example, for reviewing. It's, I think, for example, if you have a small copy for an advertising, you create it, you take it, you send to AI and ask, what do you think is the message? And if AI tells you the message that you have here is this one, and if it is correct, it means that you can validate things with AI.

I think this is more powerful than asking only AI to create your content. Because, it can help you sometimes, and I'm not saying that it won't, but I think, in the essence of creating, I think if we have time, we should create things, and I think we can create better than AI at this moment.

8.- Do you think that due to the wide possibility of AI creations, people/professionals will suffer from creations labeled as 'unoriginal' or simple?

No, I think it's an opportunity. I think AI will help a lot of people to generate a lot of content easily, quickly but will be always with the same standard framework, let's say that way, and will give us the opportunity to start creating things more outside of the box.

I think for creativity, while we are not in generic artificial intelligence models, we are very close to it, I think, where the AI can start creating, applying creativity. There are some people saying that there are already some models that can do it. I don't know. Let's see. I'm waiting for it.

But at this moment, with the models that I have access, no, it's still very far away from it.

9.- What does AI lack to be a perfect tool for SEO strategies/tactics? (or another task related to your field if it does not apply to you)

Well, I think the AI will be something wearable. In fact, I think that why AI starts with a shot is obvious because I think maybe the idea of we have with us every time, when I say wearable, it can also be what Elon Musk is doing. Neuralink, for example. I think that's the way I think things will grow in this area. And I hope I'll not be in that process.

I want to be part of the process but not in all.

Interview 2: (Content and audiovisual creator)

1.- How was the impact of AI deployed in your work, in its first look vs. now? (in SEO, Creative writing, or another if these cases do not apply to you.).

I didn't witness the AI when it appeared in the workplace, but I remember perfectly when it did appear. It was really something...It was a boom. It was really revolutionary, because I started writing and it really gave me answers and that's what AI continues to do today. Perhaps with greater precision, because I remember that ChatGPT, which was AI's big bombshell, had limited data until 2020. And now it's keeping up more and more. And I think that's the main difference. Before, it was limited, until 2020.

And now we can see what's happening these days and keep up. Possibly, not that I've really noticed, because I don't think I've really seen this difference. It must be smarter or more precise. One thing I've noticed is that it's able to provide us with links and scientific articles. Before, it couldn't do that. It said he couldn't do anything about it.

Possibly it even wrote things for nothing or without foundation and said they were true.

2.- Do you implement any AI tools today to personalize content and/or user experience? (Which ones do you use and how do you use them)

I only use ChatGPT. I've started watching a bit of DeepSeek, because they say it's smarter, more advanced, has that, has this... But I use ChatGPT a lot as an aid to my creativity. It can awaken something in me that I want to talk about or some point that I can explore, for example, that I can't remember or recall, and then I can start magicking with my head and I can unfold and be much more creative than the machine itself.

That's why I use ChatGPT, it's very efficient in terms of time and resources, but it doesn't have the human touch. I just feel the need to use ChatGPT, possibly in the programs I use, I know that Illustrator already has a bit of artificial intelligence to create vectors or something and CapCut also has artificial intelligence.

But it hasn't explored this as much as ChatGPT because there's an interaction, it's as if there's a closeness between ChatGPT and me, in this case, the human. Whereas in these other applications it's already introduced, it's really inherent and we can't even tell if we're using AI or not. Unless you actually have a function that says 'AI'.

3.- What would you say are or have been the biggest obstacles in using AI software's? (for SEO, writing, design)

In my case, as I'm Portuguese from Portugal, the AI comes very configured... it speaks a lot of Brazilian Portuguese and this can become an obstacle. As I said, it's very efficient, but when we really want to be very efficient, we look at the text and copy it, and it's usually in Brazilian Portuguese. That's a huge obstacle for AI, it's not yet configured for all the world's languages or maybe it has the default setting of speaking in Brazilian Portuguese.

Another AI obstacle could be that it doesn't give us truthful information or that we don't have the ability to question ourselves: Is this real? Is it not real? We might want to copy everything straight away because we think it's right, but how well-founded is what it's saying? Where did it get from? That's one of AI's obstacles. We don't have the crystal clarity of what it's saying or what it's doing.

4.- What percentage (approximate) of your work is irreplaceable by an AI 'today'? Either because the technology is not yet developed, or because the AI does it poorly (or another option).

Genuinely, I don't think everything I do can be done 100% by AI yet. I don't think anything I do can be done by AI. Because there you have it, you need the human hand, the AI, no matter how great the description and how precise it is of what I'm going to write, of my input, it's never going to do something like I'm thinking or imagining. It has a lot to do with content creation, it plays a lot with creativity, with what I said in the first question. But it can never replace me in what I do.

5.- Do you honestly believe that the results offered by AI are inferior, equal or superior to yours? (In SEO or other areas if this case does not apply to you).

They're always going to be worse because of what I do. I've done it several times to see if... When I'm like that, my God, how am I going to do it?

Sometimes we're asked to do something complex and we want to make it easy or quick, or we start to despair about how we're going to do it. I run AI and that's it. It doesn't do anything right. I have to do it myself from scratch and, of course, always make it better, because anything that's easy isn't worth it.

Will it be worse? It will always be worse. In terms of content creation, of course. Now, she can research things to give me quick insights, even though I question what she says. Then it's much more efficient and can even replace me.

6.- What are your thoughts on the possible loss of confidential information? Do you think this is something to worry about?

Since I'm very active on social media, I can do 'stories and I have no problem exposing myself in life but I don't really expose my personal life. I think that being on social media is what I think it is. Personal, like it's our best friend, I don't think I've ever used AI as a best friend.

I think I've only used it for academic purposes, for example. So I don't really have this question that it's going to spread. A lot of things have already spread.

Everything has already spread. In my ideology, I think everything is already known. Nothing is a secret, everything is controlled. It's not because I use AI that it's going to be different or that they're going to control me more. But I agree that there should be regulations to prevent data, with a lot of danger, with a lot of people poaching it, as if it were our best friend, from getting out, from being extracted from these machines.

(Asking for bank details or other personal data):

That's really the private staff.. That has to be locked away. Addiction to scams is becoming more and more of a complicated topic these days, because technology is advancing and AI itself can probably decrypt something. I have no grounds for this.

Possibly, if it can't already, it will soon be able to hack something and possibly also extort personal information, such as passwords, bank details, because AI is a machine, it does what it has been programmed to do. It doesn't act ethically. We have to think that AI also has to be regulated on ethical principles. It can't be made to do what a person tells it to do. There has to be a limit to AI.

Just as they implemented the closed GPT in the first week, the closed GPT came without this ethical limit. It taught people how to make bombs, how to create drugs, and then it became forbidden.

7.- Do you welcome the use of AI with rejection or with full support onto your work? Why?

I think that, again returning to the topic of efficiency, AI really is very efficient. It's really... I don't want to use this word, but AI works for us like it's there for everything. We ask, it does. It's like a slave. We ask, it does. It makes me uncomfortable, this AI situation, because it also raises that question in me of... Am I getting closer to the AI? I talk to it so much to create content, and I even say thank you, please. Just approaching from there.

Yes, yes, yes. I completely support it. Yes, totally supportive. Because it's really efficient. We can do things that would take hours or even days. It can do those things in seconds. It's a great user of the workplace.

It's very good with resources. And that's why I fully support the use of AI in the workplace.

8.- Do you think that due to the wide possibility of AI creations, people/professionals will suffer from creations labeled as 'unoriginal' or simple?

Yes, yes, yes. This has to do with humanizing AI.

How do we make AI human? As I said, I use artificial intelligence a lot to make copy-proposals, mainly. But how do we add the touch of the brand's personality? How do we put the brand's personality into the AI engine so that it gives us something? Give me a description of a photo with sushi on it. It can talk as it pleases, but my brand has a personality.

I think that the use of AI has to be circumvented with really detailed descriptions and there should also be a check of what it does, to see if it matches what the brand wants to convey. Unless you use AI excessively, then you can be considered uncreative and unoriginal. People will end up doubting the brand itself, because it becomes very mechanical and automatic. When there's a concern about providing AI with insights into

what we want it to do correctly and accurately, and verification of what IA does on our part. I think it can really be an assistant to human beings and so we can humanize AI.

9.- What does AI lack to be a perfect tool for SEO strategies/tactics? (or another task related to your field if it does not apply to you)

Well, the AI comes configured with its own personality. ChatGPT has its own personality, it's friendly. DeepSeek is probably more rigid. For example, ChatGPT will talk one way about China and DeepSeek will talk another way about China, and maybe opinions will clash. AI needs to have multiple personalities, in my opinion, and it needs us to let it create all these personalities.

In addition to this, AI needs to be more involved in what it says because I don't know how it does its research, I don't know if it reads it. I don't think it has the capacity to read it. I don't know how it works, but it needs to get more involved with what its research and see if it's true.

Just as there's a news fact-check, it also has to have a fact-check. And that's mainly it, it has to have a fact-check, it has to have the personalities, and we must have the ability to create them and that's mainly it. It will evolve in terms of mathematical problems, code, all that. And maybe it will evolve and maybe it won't, it will certainly evolve in terms of visual creations, such as images and videos. I remember that last year we started seeing, maybe last year or the year before, in 2023, we started seeing the first videos with AI and after a year it changed completely (2024).

The video did look real and it seems that some people really can be fooled, so much so that today there are Facebook pages that are totally AI and people fall for them. And that's it. I think it has to be customizable and there has to be a fact-check. And that's it.

### Interview 3: (Programmer and web developer)

1.- How was the impact of AI deployed in your work, in its first look vs. now? (in SEO, Creative writing, or another if these cases do not apply to you.).

AI was used by me a lot in terms of testing. Testing, understanding how it works, if what the AI said was correct and it was, especially in terms of code, if it was well structured, if there were no flaws. And now, in more recent versions and with the evolution of IA, there's not so much concern, at least on my part.

I think it ends up being a tool that helps me solve problems and understand problems in a faster and more structured way. In other words, it makes my job easier and I can produce more efficiently and more quickly.

2.- Do you implement any AI tools today to personalize content and/or user experience? (Which ones do you use and how do you use them)

The main one, ChatGPT and now DeepSeek. But these are the tools that I basically use more for my day-to-day life, for my work, to connect everything to code, troubleshooting and so on, instead of consulting Google here, when I need to, I don't know, structure a project, structure a file system in a new project, I end up mainly using ChatGPT chat to help me in this process.

I've also used some music production tools. Everything without voice, ambient music, linked to video production, I needed music. Copyright is something that happens a lot these days, isn't it? And there you have it, it also helped me to find some music that I could use without any problems with the publications we went to.

And generating images too, from time to time you also play around with generating images. I think it was Bing that I used the most, Bing Creator. But then, it's more of a joke, nothing professional.

3.- What would you say are or have been the biggest obstacles in using AI software's? (for SEO, writing, design)

One of the main obstacles I encountered was the AI's timeline. In other words, the AI doesn't have very old memories, nor is there much information about recent memories. Especially with recent memories, things that, for example, at Shopify have changed and that I needed the IA to help me understand, I felt that the IA didn't have the necessary information yet, because it was new and there wasn't much information on the internet. That was an obstacle that it tried to help with, but it didn't.

4.- What percentage (approximate) of your work is irreplaceable by an AI 'today'? Either because the technology is not yet developed, or because the AI does it poorly (or another option).

I'd say maybe 15% of my work is irreplaceable. In my field, everything related to IT, code production is increasingly linked to AI, you don't have to program the old-fashioned way anymore, typing, typing, typing.

Nowadays, I think that a person who needs something, in terms of code, a function, anything, explains what they want, the AI returns something and they try it out.

Maybe 15%, 20% of my work will be irreplaceable because it's that thing of asking me to do this or asking me to do the rest, I think I can do everything. Maybe in a while, programmers, those who manage to create an AI focused on a project and focused on technology, will probably be the future programmers. Instead of programming code, they going to program an intelligence that does the work for them, almost automated.

5.- Do you honestly believe that the results offered by AI are inferior, equal or superior to yours? (In SEO or other areas if this case does not apply to you).

I believe that AI can provide a better or equal result to what I can do. Anything that involves new technologies or new tools, I believe that humans can develop solutions better, since AI doesn't have the knowledge to be able to produce a coherent response that works. It depends a lot on the occasion, it depends a lot on the problem, but I think humans can still do good things.

I think we still need more humans than AI. AI helps, but I think you still need humans in that sense.

6.- What are your thoughts on the possible loss of confidential information? Do you think this is something to worry about?

I don't think AI is going to steal more or less information. Our information is spread all over the place. From the moment we create a Facebook account, create a Google account, we're indirectly accepting the sharing of data, so I don't think AI is going to be something that's disruptive here, it's something that's going to... At least at the moment, I don't think that's going to be the change.

What we're realizing is that AI also ends up not sharing confidential information about people and companies, so it will collect information, yes, but I think... What software or application today doesn't collect information? It may be a problem in the future, but for now I don't think it will be any different from Facebook or Google.

7.- Do you welcome the use of AI with rejection or with full support onto your work? Why?

I welcomed AI with open arms, yes. It helped me a lot with problem-solving, with understanding why that piece of code does what it does. It's helped me a lot because you don't know everything and when you don't, you used to have to spend maybe 20, 30 minutes, for example, researching whether you have overflows, researching what the solution was, why it didn't work and, in very specific cases, sometimes you couldn't find a solution.

I believe that with AI you can reduce this time a lot and get a result that is more reliable, more accurate and closer to what you want.

Especially in very specific cases, with very specific problems.

8.- Do you think that due to the wide possibility of AI creations, people/professionals will suffer from creations labeled as 'unoriginal' or simple?

I think it's already happening a bit. When you see Amazon's warehouses, it's not like they used to have a lot of workers and now they just have machines. So I don't think it's only now with this AI boom that it's happened, it had already happened before and everything that is manual labor and robotic work, I believe that in the future, yes, these people will be replaced, as they already are and will continue to be due to the efficiency and low cost of having a machine do the work of a person.

But that's already happening, car factories, everything is already robotized, with one person or another in control. I think AI will help these robots, but it already existed. So AI is just another excuse to take people's jobs away.

9.- What does AI lack to be a perfect tool for SEO strategies/tactics? (or another task related to your field if it does not apply to you)

I think it's probably the human side that's going to be lacking and I think it's always going to be lacking in the IA, because I can ask him something for one store and ask exactly the same thing for another store and he'll give me the same answer, but I believe that the human side of looking and seeing the end product is going to make the difference, because on one side it works well, on the other it could work better, but what I asked for was exactly the same.

I think that here it's a question of adaptation and of the AI being able to look at the two problems and despite the question being the same and the resolution being the same, having the human side there of realizing that I'm doing the same thing for both, but on this side I'm going to do it with a slight alteration and on that side with a slight alteration to make the creation more human, closer. It looks like it's been made by a person, otherwise everything will be the same and we'll be back in a few years' time with all the same buildings, because if everything is done by robots, if I ask for a 20-storey building, it will give me a 20-storey building, period.

#### Interview 4: (Chief Operating Officer)

1.- How was the impact of AI deployed in your work, in its first look vs. now? (in SEO, Creative writing, or another if these cases do not apply to you.).

In terms of my work, not so much in SEO or writing, but just in terms of copy and mainly answering questions about what procedure should be taken or how best to do something.

It started out as a very small impact, more in terms of looking for some interesting message, some copy and all that, but at the moment it's very much a job of also quickly having the answer to how I can do a procedure or how something can be updated, something like that.

So it's been quite an evolution, really, because it started out as a tool simply to think of some copy or have some ideas, just to put, in my case, in online stores and have that content, but now it's already a tool that helps me structure how a procedure can be done and mainly also a bit of programming, HTML, how I can better do flows or other procedures within Shopify online stores.

2.- Do you implement any AI tools today to personalize content and/or user experience? (Which ones do you use and how do you use them)

In reality they're very simple, I only use ChatGPT and in reality I only personalize some content, some copy, but otherwise I use it more to ask questions about how I'm going to do something and mainly to structure some programming so that I can then put it in and make some changes. Has ChatGPT generated any penetration? I use the general one.

3.- What would you say are or have been the biggest obstacles in using AI software's? (for SEO, writing, design)

I think the biggest obstacle is for people to think that the content isn't going to look like it's from a human, it's not going to look personal, it's not going to look like someone wrote it, it's going to look like something that's been debated. I don't think so, I think it's been improving. Even the way in which AI responds to explaining concepts and giving that information has improved, because at the beginning AI responded a lot to the concept itself and then you always had to question it a bit more and a bit more until you had the information you wanted, and now AI is already doing that job, so to speak, it's moving on a bit more in that case.

4.- What percentage (approximate) of your work is irreplaceable by an AI 'today'? Either because the technology is not yet developed, or because the AI does it poorly (or another option).

I think that 60% of my work would be irreplaceable, but I may be being too generous with myself. But why isn't it... I think it's a question of... There's a good deal of work that AI obviously helps a lot and replaces a lot and speeds up a lot, but then the decision-making and the fact that how are we going to take this data that AI has given us and how are we going to act on it, then yes, yes.

I don't think AI can necessarily meet all the requirements in that field yet.

5.- Do you honestly believe that the results offered by AI are inferior, equal or superior to yours? (In SEO or other areas if this case does not apply to you).

It depends on the topic. It could be...if I have to finish structuring it... It's like this, if we're thinking from the point of view of asking the AI to write us something, an e-mail for something or an explanation, something like that, they're superior.

The AI will always take into account some detail or some feature that I might miss. But sometimes when we want the AI to give us results, sometimes of more recent information or how we can structure that information or things like that, the AI doesn't always have the most up-to-date information, or it doesn't always answer what we were asking. It's a bit more like that.

It tells us something that may not be exactly what we were looking for or the question we had. And then yes, the result is inferior because, for example, searching for documentation on Shopify is easier and it's quicker to check the documentation than waiting for the AI to give us all the information.

6.- What are your thoughts on the possible loss of confidential information? Do you think this is something to worry about?

I think so. I think people should always be aware of the information they put out there and how personal it is. But I think it's always important to be concerned about personal information because it's something that can always be accessed in some way and can be used for other purposes.

7.- Do you welcome the use of AI with rejection or with full support onto your work? Why?

Full support. Completely. Because AI can take a lot of information and quickly, from there, help me draw conclusions and help me make decisions. And if there wasn't AI, analyzing all that information and making all those connections that it does this, and it does that, would take up a lot of time.

And AI takes that time away from me to leave time for what actually ends up being more important, which is actually making the decision and moving forward in the sense of... not in the sense of analyzing information, but in deciding what we're going to do with that information in the future.

8.- Do you think that due to the wide possibility of AI creations, people/professionals will suffer from creations labeled as 'unoriginal' or simple?

In some cases, this can happen, but I think that, in reality, it's a question of the person being able to take advantage of AI to make a base. To have a basis, and then, obviously, to always change what has been done and what has been written and to always give it their own personal touch.

It's obvious that if you copy and paste what the AI tells you, it's not really original, but it's always something that is then touched by the person, so it's always changed by the person themselves.

I don't think that's something that's going to happen.

I mean, my area of work doesn't necessarily have anything that's very, very personal. It doesn't have something that's artistic or that's asking for something unique, really. It's more an area of optimization. So maybe I don't have this fear so much either, or I don't have this perception that AI can take away originality or make it seem like the things people do are too simple or not enough or not good enough. More like that.

9.- What does AI lack to be a perfect tool for SEO strategies/tactics? (or another task related to your field if it does not apply to you)

I'm not sure here. What would the AI be missing because when I ask it something, the AI already answers me. In this part of SEO, it's not something I'm familiar with. But I don't want the AI to have a human touch either. We'll leave that to you, I don't see AI as... I know that AI is being used a lot in creation. There's copy, descriptions, texts and all that, but I don't think it needs to have a human touch. I think things should always be afterwards.

In reality, what does AI lack? Not a personal touch. I don't agree. That it's a human touch.

As AI advances, AI might start not having to specify so much what you want. AI can be more comprehensive in that sense, because AI, at the moment, you still have to ask exactly what you want or you can direct it without any vanishing point, so to speak. And in the future, perhaps it will... The requests may be broader and more complicated to understand, but the AI will be able to take something from it and give the most correct answer.

## Interview 5: Programmer 2.

1.- How was the impact of AI deployed in your work, in its first look vs. now? (in SEO, Creative writing, or another if these cases do not apply to you.).

So I guess that's like in software development. We as developers are really impacted by AI, I mean every time you kind of have an interaction with AI. So I would say that is my first look, I guess, that had started off my career. I was trying to not touch as much as I'm doing right now, getting in touch with AI because for a developer, it's not great for you to, I mean, like in AI to do your work.

So, but now as I'm, I'm really used to not only doing my work using AI, but also, learning with that, I would say that, it's a really great impact. I mean, I think that for us as developers, AI really gave us boilerplate, which basically gave you, and it starts the initial project, and I think that it accelerates my work and also I learn a lot. So, during times that I'm currently working with something new, I think that AI sort of accelerates a lot and improves my knowledge. I guess that is really great, and I'm looking forward to it, and trying to think in the future, I think that, us as developers are really scared about AI, because the way that it is increasing, I would say that, in the near, in the really near future, probably most of us as developers... it's not that we won't have jobs, but at the same time, some tasks AI would take care of, not developers anymore.

2.- Do you implement any AI tools today to personalize content and/or user experience? (Which ones do you use and how do you use them)

I'll probably stick with ChatGPT, or DeepSeek, or any AI tool. I mean, I'm currently working with LLMs, it's basically in ChatGPT, so I'm, like, in this sense, I'm using AI to identify algae, so, basically, a total work of AI, but, I mean, at the same time, I need to develop this model.

I think that, as I said, ChatGPT and DeepSeek. Now I'm looking forward to working on Vertex AI, which is a platform of AI from Google, Quin, Lima, it's also from Meta from Facebook, and most of the cases, it's, as I currently said, just basically boilerplate, something that I don't really need anymore to do.

Like the AI will already, put these small contents of codes for me and I just need to take care of something that AI, it's not the best to handle it for now, I don't know in the future, but yeah, probably these ones are the most used.

I mean, to be honest, it's pretty impressive. Like the way that, based on the investments, that they developed it in a really short time. And from the investments, I think that it's really impressive. I will, give the win for DeepSeek, to be honest, like the investment are just really different.

I mean, like DeepSeek invested for about like 10 million, as they said, and like ChatGPT, I think over a billion, so it's really different, but at the same time, it's really great because,

like everyone's trying kind of... it's winning. For us as developers, we are getting better and better tools to work with.

But yeah, I would give the win for it for now

3.- What would you say are or have been the biggest obstacles in using AI software's? (for SEO, writing, design)

So, for us, I would say on my side as a developer, but I'll try to say for other positions, I think like, for us as developers, is that AI, at the same time, it's really great because I cannot do what a 'real developer' can do.

Right. So they really can build some advanced stuff, but not like everything, especially I would say like in some areas, as a developer, there are a lot of developer jobs and differences, I think that AI cannot handle most of them. But like, this is probably the main obstacle for a developer because you would think like a developer doesn't do anything, right? Like the ai, AI will handle everything, but it's not that. It's like, I think that AI only will give you a piece of it but for sure you'll need to run all over like you.

You can't rely on AI so that's an obstacle for most of developers because they still need to do most of their jobs and work. For other positions, I think that, I don't know, like maybe as a ghost writer, like for those type of people that, are like getting paid by, writing posts and something like that, most of the time AI is just not that natural as a huma, I mean they will improve your text, but as a human, like we have of course a sense and we know like what the, we would tell for a human rights, but AI it's lacking of sense as what a human will.

So I think that for other positions, I would say that AI is just a bot, right? It's a robot, so they cannot have feelings and stuff like that.

4.- What percentage (approximate) of your work is irreplaceable by an AI 'today'? Either because the technology is not yet developed, or because the AI does it poorly (or another option).

I think like 10 I guess, not like 'AI for sure', like the AI that we have right now, cannot like handle creating, for an example, as I said I'm currently now working on a identifier of algae, but at the same time can identify plants and stuff like that and like imagining that this project, you need to be like the server, you need to do not only the interface that I think that like AI could handle stuff, but it's not that custom, right? So, ChatGPT create me an interface in this way and like that they will, they for sure won't do like 1 percent of what you would like to have, right.

They will just like builds, on top of other codes that they are like already previewed on for. So that, that's how actually AI works because like, they do not like learn by themselves, like they actually learn by the prompts and inputs that they already have in their database. Imagine when you have a question, this question has already been answered before.

They already have like this prompt and straight ahead, they will say you what they will say to another person and at the same time they will improve. That's what machine learning is about, so machine learning is just basically when the machine does not know like the answer or is lacking most of the information, so they will just, be improving by more prompts and stuff like that.

So, in a nutshell, no, for sure.

Like AI right now cannot handle doing a big project by itself, but let's see in the future, I don't know.

5.- Do you honestly believe that the results offered by AI are inferior, equal or superior to yours? (In SEO or other areas if this case does not apply to you).

I mean, as I said, I think that depends a lot. I think it depends on what your requirements are. Let's say that you want a really small stuff that is just regular stuff, like it's not that difficult to do. I would say that it would be similar but really most of the cases it's just not reaching 1 percent of what I would do, because I think that the most difficult part now for AI is to expose complex code. And like the, there depends on a lot and, like tons of tons of lines of code They cannot like handle. Like, this type of stuff. So, it's really easy for you to notice, if you have a really easy problem for them to solve, but you just throw a lot, a lot of codes, they wouldn't understand and know how to fix it. Because as you throw, through a lot of lines of codes, they would be really hard to do.

But at the same time, as a human, I could write, read everything, understand what's like the problem and fix it. But creating stuff from scratch is just not like that.

I cannot even create like a landing page by itself, in the way that you want, I mean, they will just like through things that make sense, like a header, a footer and I mean, that's just web development and web development, to be honest, it's like the most easy stuff that you can do as a developer, like that's not a big deal. But for AI, it's still like an easy thing for humans, it's still really hard for them. So I will assume that what's like the lowest rating that I can do, it's not just, like it's equal, similar. It is worse for sure.

6.- What are your thoughts on the possible loss of confidential information? Do you think this is something to worry about?

What are your thoughts in the possible loss of confidential information regarding to AI? Yeah. Um, so you mean like giving them confidential stuff? Yeah. And what can we use? Like if we have this, and like if we use that business, say, like Facebook or something like that. Yeah.

Are selling our information on private data. Yeah. So what do you think, like what are your thoughts regarding this in ai? to be honest, that's a funny, subject because like if you start to think that YouTube, for an example, when you search something. Like, let's say you just searched, like, about a sneaker that you really want to buy and like 10 seconds after it, like, there is an advertisement.

Or like you start to see and notice that like your homepage or from Facebook, it's just like lots of lots of tokens of sneakers and stuff like that. That's actually happened because they have an AI, which is basically based on machine learning that to know. What subjects that you like, that you enjoy, right?

I don't know if that's like, would insert, like, in this aspect, like, of selling your information. But, like, I think that makes a lot of sense because, the things that you type, the things that you say actually on your phone, and Search and stuff like that, they are always using it. So to me personally, if I am searching about something and then suddenly I'm just getting tons of tons of advertisements talking about this.

Seems to me that they are kind of selling it because someone is earning from it, right? It makes sense, like, I would say that these aspects, they are not confidential, right? Like, I like sneakers. It's not that as I just like, I don't know, gave my passwords from my bank, right? This type of stuff.

But at the same time, yeah, they, use a lot of your information. Some far good that I think that's like, this is a really great point because if you like, if you enjoy something, why not would like to see and watch more and more of this, right? So if I like football, why I wouldn't like to see on my YouTube homepage.

Like tons of football videos, right? That's what I'm telling. But, from a perspective of What would you say like? Information that you could not pass from you like to somebody That you should pass, like, passwords, maybe like bank accounts Or even your history

Yeah, they, I would stick to it at the same time, topic, like they use it a lot. But like telling that DeepSeek is selling your information to like the China government. I'm not sure about it. I mean. It could happen. I wouldn't doubt it because somewhere this information is located, right, that you are like from Porto, Portugal, that you have this IP, that your password from Facebook is that, like, because the way that I, how I already have Like some experience from it.

I would say that this information is just like somewhere And someone could find it and someone could like this is probably the most problematic Problem of the situation is that someone that shouldn't have the access of it Could have like, because like, it's really easy to notice that sometimes like a big tax just lost their information because someone just hacked into their database and get some information, right?

It's really not that difficult to see it happen. So this could happen, but I'm not sure. And I don't know, I don't believe that this selling of information of course, a lot. Because it would just be a huge problem, but at the same time, I just do not agree for you to, tell your password is chatty petite.

7.- Do you welcome the use of AI with rejection or with full support onto your work? Why?

No, yeah, it's really useful. As I said, like, it seems kind of controversial at what I'm telling, because at the start I was just selling, Oh, they like the worst. But this I'm talking like as trying to replace myself, right. Trying to replace what I do. These, for sure, nowadays it won't occur, it's impossible, but like for small stuff, like for boilerplates as I already said, like these, they are really good, like they can provide you at least like a tip, what you can do, what you can fix.

So they are really great. They usually have a point of view that you probably won't have and would like for sure help you doing something. So I fully accept. I use it not like always, like day after day I'm using it, but for small things, small adjustments, questions and trying to, have like a question that I, I wouldn't ask myself about like this.

They are really great. So I fully accept it. Considering, like, the white possibilities that tools like JTV D or one another have to create stuff either artistically, either by text, either by codes, do you think, like, in some moment, maybe now or in the future, the professionals, the humans that work in this kind of stuff, are, like, his work is going to be labeled as an original, simple, original?

8.- Do you think that due to the wide possibility of AI creations, people/professionals will suffer from creations labeled as 'unoriginal' or simple?

Yeah. I mean, as I said, like a developer job could be like, could do just tons of tons of different things. Right. I like to make a measure, measure by like, difficult. So for an example, as I said, like working, doing a web development, could be like, it's way more easier than like working as DevOps, and other stuff that requires more knowledge and, it's just more difficult, right?

So for easier, like jobs from a developer perspective, I would say that I could not like, It's made a time, but I would say like, they would be like the first ones to have really problems doing their work because probably AI would handle, handle it, I would say like, so imagine like if you, the future, this actually already exists, but it's not that really great, but imagine if you take a picture of, your design and you send it to an AI and just tell them, hey, create me this website, right? For now, it's just not easy to, it's just not actually impossible for an AI to do that. So, but imagine that in the near future, I would say like three years from now, something like that, someone that never called before. I've never coded before, just take a picture from a design of like their homepage, like how it would like to have.

And then, I would already give like the codes and every single stuff for like be exactly how the image is providing. Right. So this type of job, I think that people that are doing right now and from like past years, would be like the first ones to have issues and be useless, like in this sense. But I just cannot like, see that like more than a half of the developer's jobs in other areas will have this same problem because, as like, it's really some jobs.

Are really personal, like to the, the enterprise and they have like really business stuff occurring. So they, as I said, like, they wouldn't be able to like put stuff that, would affect their company. So like putting a key that is. Like for their company and if they just, threw it away from like a chat GPT, something like that.

They could like be in the future, like lost in something. So this type of stuff, but I mean, in the near future, I really imagine that some developer jobs will be useless, like AI would handle it, but for now and for, I don't know, at least I hope three years, something like that, it won't occur. Perfect.

9.- What does AI lack to be a perfect tool for SEO strategies/tactics? (or another task related to your field if it does not apply to you)

That's a really tough question. I think that as I do not rely much on AI, I wouldn't say that like they are missing something.

To be honest, they are really great, but I would say a thing that they are, they have really general answers. So they do not, sometimes they do not just have like, really useful case for this type of scenario. As I said, if you're like happening to have like, let's say an error that you just got it once and no one have, have.

Ever had it before. Right. So the, I wouldn't be prepared for this question. So they will just throw you a general answer. They will for sure. They won't like, help you in it. So this type of stuff wants like the AI. So I think that's what defer like a great. Answer from an AI and what like AI is missing for now is just like that.

They are not prepared for like every scenario, for sure in like programming, like being a developer, you will have, like, you will daily face like a different error, a different stuff that you never saw it before. So for AI to handle it. And, if it's not that, like, usual to happen, they just will give you a general answer and wouldn't solve the problem.

So, for developers, I would say that this is, an issue, like, if you just do not know what to do, if you Google it, if you do not, like, if the AI just do not help you in it. You will just need to find by yourself what to do. And that's the fun for me, not the goal for us. But I, I would stick with it.

Appendix 4:

Google Search Console Data Collection: Oddtakes

