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Exploring the Potential of ChatGPT for Human Enhancement in a Posthumanist

Context

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Supervisor: Lars Botin

Student: Esmanur Aslan

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Abbreviations

AI	: Artificial Intelligence
LLM	: Large Language Models
OECD	: Organisation for Economic Co-operation and Development
GPT	: Generative Pre-Trained Transformer
NASA	: The National Aeronautics and Space Administration

Exploring the Potential of ChatGPT for Human Enhancement in a Posthumanist Context

SUMMARY

This thesis basically explores relationship between the concepts of artificial intelligence (AI) and human enhancement in a posthumanist context. As a great yield of technology, AI has become a vital support and phenomenon for everyday social life and economic activities. One of the most groundbreaking AI-driven tools which is discussed in large circles these day is ChatGPT by an AI research company called OpenAI. This AI chatbot tool is surrounded by a heated debate about its potential impact on the future of work because using its database and conversational interface, it can perform a large number of small and big tasks and respond to user prompts in seconds, rendering itself a game-changer factor in enhancing human performance. With its such enormous potential impact, ChatGPT raises several important questions including the one about the extent to which it may augment or restrict human skills, as well as the ethical implications of such interactions. Upon review of the existing literature, it is apparent that there is a lack of direct research exploring the relationship between ChatGPT and human enhancement. However, the available literature highlights several related studies, such as those examining the intersection of AI and human enhancement or investigating the impact of AI on productivity. Similarly, a growing body of literature estimates the productivity effects of ChatGPT on professions or tasks and these studies often acknowledge that ChatGPT substantially raises average productivity by enhancing individuals' capacity. Through my research, I sought to make a meaningful contribution to the expanding literature by investigating the novel subject of the relationship between humans and ChatGPT. Specifically, I delved deeper into exploring the potential for human enhancement or limitations that arise from this interaction, approaching it from the perspective of the users. By employing a posthumanist lens - which emphasizes the interconnectedness of humans and non-humans as a theoretical framework, my research also aimed to illuminate our changing attitudes, limits and interactions with technology in the 21st century. To collect data for this study, I conducted semi-structured user interviews with 8 professionals from various backgrounds such as software development, marketing, academia to gather data on the users' perceptions of ChatGPT's role in enhancing or limiting their capabilities and accordingly their productivity. The interview questions have been designed to probe the users' experience with ChatGPT, exploring the ways in which it has enhanced their ability to communicate and perform tasks and identifying any constraints or drawbacks in using ChatGPT. The results have indicated that ChatGPT improve individuals' abilities and therefore their productivity to a large extent as all of them have clearly stated that overall impact of using ChatGPT in their daily and professional tasks is predominantly an enhancing and positive one, consequently improving their productivity. Moreover, a significant majority of the participants demonstrated a remarkable tendency to perceive ChatGPT as an extension of themselves, often referring to it as their 'right

arm' or 'assistant.' This observation in a sense serves as a compelling confirmation of the posthumanist perspective, highlighting the already established entangled and dynamic relationship between humans and non-human entities.

Furthermore, participants' ability to adapt their commands and engage with ChatGPT in novel ways, ultimately overcoming technical or general obstacles and arriving at conclusions or solutions, exemplifies the emergence of a new mode of cognition or knowledge production. This mutual and dynamic relationship can also be interpreted as an indication of the transformative shift towards the already envisioned posthumanist paradigm.

Chapter 1: Introduction

“What will be the next huge leap in humanity’s progress? We cannot know for sure, but I am reasonably confident that it will involve the radical extension of technology into the domain of thought.” (Ben Goertzel)

1.1 Background and Context

Technology is an integral part of our lives and most of the time it brings value and drives our societies forward. A fascinating yield of technology is AI, namely artificial intelligence. Artificial intelligence is gaining even more traction each and everyday with its potential to transform various areas of our lives. One of the most groundbreaking AI-driven tools which is discussed in large circles these days is ChatGPT, which is emerging as a “cultural sensation”(Thorp, 2023). This AI chatbot tool allows functionality that previous generations of chatbots could not produce by simulating human-like conversations and providing results with high accuracy through machine learning algorithms fed by natural language (Kasneci et al., 2023). Using its database and conversational interface, ChatGPT can perform a large number of small and big tasks, from instantaneous language translation to bug fixing in code, creative writing, summarization of lengthy academic essays and much more. Accordingly, we see many professionals and individuals from different backgrounds

alike using it to facilitate their daily tasks and responsibilities, rendering it a significant factor in enhancing human performance. Receiving global attention for its such extensive abilities, ChatGPT now is surrounded by a heated debate about the potential impact it may have on many aspects of life and society.

First and foremost, this AI technology is expected to substantially impact the future of work because depending on the specific roles and industries, ChatGPT may enhance professionals competencies and increase productivity or possibly displace human workers altogether. It is already a well known fact that AI technologies is expected to bring huge changes to employment. As Acemoglu (2021) discusses in his book the likely economic, political, and societal implications of the present development of AI technologies, these algorithms have the potential to affect competition, lead to excessive automation and inequality, drive down wages and lead to unemployment unless they are not properly regulated. However again- they also hold promise to create a positive direction in employment arena at the same time.

One of the main professional areas which this tool is expected to largely transform is education since ChatGPT can offer personalized learning experiences to individuals with its efficient skills to understand prompts, gather relevant data and generate lengthy text in seconds (Kasneci et al., 2023). With its remarkable capacity for information processing, ChatGPT's writing abilities in fact seem to greatly exceed those of a typical student (Zhai, 2022). In terms of tone as well, AI-generated writing performs very well by providing efficient results with logically structured and also a generally accurate content. The ability of AI to swiftly and precisely pick the information it requires makes it quite more efficient than humans in terms of

information retrieval as well (Ibid, 2022). We can assume that all these features in return may contribute to individuals' intellectual and cognitive development as they are integrated in human beings' learning process. Meanwhile, Khan Academy - a nonprofit organisation with a mission to provide a free, quality education for anyone around the world and Duolingo - an online game-style language learning tool - are already piloting a version of ChatGPT to guide their learners through maths and language problems, help fix a code and serve as a debate partner in verbal subjects (Vincent, 2023). Overall, ChatGPT can drive major changes to educational methods and practices, basically to the way we learn and teach in general. As discussed above, this cutting-edge technology seems to offer huge advantages and major changes to jobs and the risk is obviously not limited to the field of education due to ChatGPT's advanced features that might be of great use elsewhere too, such as its capacity to handle and analyze enormous volumes of data, comprehend natural language and produce responses that quite effectively mimic those of humans. To reiterate, these features can become highly useful in increasing productivity, creating opportunities and innovations in different fields but at the same time they can completely disrupt and transform these professional domains.

Apart from the huge impact it may have on the employment market, ChatGPT raises many concerns about its unexpected ethical implications that may arise from the ordinary interaction (Hughes, 2023). That is because utilising ChatGPT in daily professional and educational tasks bear the risk of bringing about numerous unexpected results. This fact makes it critical to examine these larger consequences and challenges. For example, in the context of academia, ChatGPT's capacity to create human-like language brings about serious issues concerning plagiarism and

academic integrity, which could as a consequence diminish the value of education and credentials in academia (King, 2023). Another key issue which might arise with any other AI system as well is algorithmic bias (Dis et al., 2023). Algorithmic bias can be defined as the problem where a flawed learning process leads to biased outputs from the algorithm. That is to say, when the training data or the model's assumptions are lacking or inaccurate, the algorithm may generate unfair or discriminatory results. For instance, if the dataset used to train ChatGPT is not varied enough, its algorithm may favor certain groups of individuals or perspectives over others and there are multiple, different categories of algorithmic bias (Danks & London, 2017). Accordingly, bias in huge data models might have unforeseen and serious implications when utilized in decision-making mechanisms which in a sense determine ordinary people' destiny, such as recruiting or college admissions. Concerns about privacy and data ownership are also key challenges which we should talk about, especially given the fact that large companies and governments increasingly rely on different AI mechanisms anymore while -deliberately or unintentionally- feeding massive volumes of their data to train these algorithms. Additionally, many users and authorities worry about accountability and transparency issues in the creation and use of these algorithms and therefore about the output of these algorithms as well. Because there is not yet a clear-cut system which regulates this flow and since AI technologies are limited in certain terms such as human-specific abilities like creativity and empathy, they might fail to generate understand complex human emotions, necessitating a 'check and confirmation' mechanism to maintain dependability. In light of all these, it is vital to ensure that development and deployment of such artificial intelligence systems are conducted in

an ethical and transparent manner, with enough safeguards in place to protect individuals and communities from possible harm (Aljanabi & Chatgpt, 2023).

1.2 Problem Statement and Argumentation

As we pointed out earlier, ChatGPT as a generative AI tool is largely discussed in relation to the topic of future of work and its transformative effect along with some relevant ethical implications such as reliability, accountability etc. With such important risks on one hand and diverse benefits on the other, there inevitably arise several crucial questions and deep contemplation about its position and function. Among these debates, there is a growing body of literature estimating the productivity effects of AI on different industries or jobs. The scholars who look at this relationship, often acknowledge that ChatGPT substantially raises average productivity. For instance Kalliamvakou (2022) identifies that software developers could write code up to twice as fast using a tool called Codex, which is a system based on the earlier version of the large language model GPT-3. Similarly, Noy and Zhang discover that many writing assignments may be done twice as quickly and argue that “exposure to ChatGPT increases job satisfaction and self-efficacy and heightens both concern and excitement about automation technologies” (2023). Korinek also assesses that, based on 25 use cases for language models, “using large language models can increase economists’ productivity by 10-20%” (2023). Given the vital role of new devices, technologies, and procedures in determining productivity, therefore in employment and economy, researching and comprehending this topic in more depth is extremely valuable.

So the question follows: ‘Can these gains in specific tasks translate into a real-world setting, especially from the perspective of ordinary ChatGPT users?’. As these previously mentioned studies were mostly quantitative in nature, exploring this question in a different context, namely in an empirical and qualitative one and in relation to human enhancement has motivated me to formulate my research question. This inquiry and approach formed the backbone of my research topic and main research question, which is **“To what extent does ChatGPT enhance or limit human abilities from the perspectives of ordinary users?”**. Accordingly, this thesis will be concerned with understanding the users’ perceptions of ChatGPT's role in enhancing or limiting their capabilities as these aspects would be a critical component of their productivity especially in the context of cognitive enhancement and knowledge production. While investigating these subjects, I will also explore the nature of the relationship between them (ChatGPT and users) and ethical issues which may arise from this interplay, because to achieve best practices and approaches in the development and use of intelligent machines, the nature of the relationship between them should be properly understood and necessary ethical debates should be acknowledged.

It is my intention make a contribution to the literature by studying such a new topic as ChatGPT with a novel approach, namely looking at the subject through a posthumanist lens. I would like to look at this interplay between AI tool and human beings not just as a case in digitalisation but also as a case of philosophical contemplation because the world around us is changing and this in exchange alters the meaning of being a human and our existence as we are progressing into a posthumanist society where the boundary between human and non-human is

increasingly vague because of the impact which technology creates on us humanbeings. Through investigating users' experiences and impressions of this AI technology, how they are influenced by it and how they see its role, I aim to understand what the current relationship between them looks like and contribute valuable insights to the body of knowledge on AI, human enhancement and productivity. Ultimately, my thesis aims to understand how technological developments, specifically AI, can transform our human capacity and daily existence, create what kind of results in productivity and knowledge production and ultimately what this might imply for the posthuman condition. My main argument in this study is that as previous research in literature highlights, AI technologies more specifically Large Language Models like ChatGPT has a great potential to improve individuals' abilities and therefore their productivity in parallel to the fact that the participants of this study acknowledge that ChatGPT enhances their capacity in many ways such as providing quick and mostly accurate information, fastening decision making, saving them a lot of time etc. Besides these, many people have already a tendency to consider ChatGPT as their extensions by calling it as their 'right arm' or 'assistant'. This indeed means a lot from a posthumanist perspective and from a philosophical standpoint because just as posthumanism would emphasise, an entangled relationship between humans and non-humans is already in place. Drawing from this circumstance, we could even talk about a new mode of cognition, a new way of knowledge production arising from this common and symbiotic relationship . As for limitations of this interplay, we should note that the users of ChatGPT are aware of this tool's inability to tackle with certain types of tasks or information and its limited role in authentic knowledge production. With respect to that, they explain that by changing their prompts or finding other ways toward solution, they are able to

overcome and address these issues and can still utilise ChatGPT. Meanwhile, they have questions and reservations about its potential impact on weakening their own cognitive capacity in the long term due to frequent reliance on this tool even if they do not feel any direct impact regarding this at the moment. However, these two instances do not change the fact that from the perspective of users overall impact of using ChatGPT in their daily and professional tasks is predominantly an enhancing and positive one, consequently improving their productivity.

1.3 Methodology

My research was conducted through semi structured in-depth interviews, namely through a qualitative research method. This type of research is a way of “exploring and understanding the meaning individuals or groups ascribe to a social or human problem” (Creswell, 2014) which differs from quantitative research, where the focus is on testing and evaluating the data. (Silverman, 2015). Accordingly, the main reason for applying this method is that semi structured interview format is quite practical for undertaking in-depth conversation and it allowed the participants to freely express their views and experience with ChatGPT and also provided opportunities for me to realize other relevant issues and problems that I myself may not have previously considered. It is also worth noting that, in most cases, through this method a researcher can follow up on any verbal and nonverbal emotions, such as smiling or silence, in order to provide information that may be valuable in the final data analysis of various themes gathered from the interview using this approach. (Ritchie & Lewis, 2003). As my main focus was also about understanding the perspectives and experiences of ordinary users, this method has been very practical and insightful. My questionnaire included four demographic questions (age,

educational level, gender and career) as well as questions aimed at stimulating the participants' opinions, experiences, and approaches to the study question. (see Appendix 1). Interviews with participants were held on different online platforms such as Google Meet, Zoom or Skype, according to their preferences during May 2023. Each interview lasted around 15 to 25 minutes. The interviewees gave their informed consent and the audio recordings of the online interviews were captured with a recorder and then annihilated after the study. Later, all of the interviews were transcribed and translated fully and only irrelevant parts were left out. As a researcher, you may have an influence on your findings, particularly on the people you speak with and interview, without intentionally or not. According to Creswell (2012), it is critical to be explicit about your personal thoughts, feelings, and experiences so that they do not interfere with your focus in the interview, your analysis, or the persons you interview. So, in that regard I did my best to not to influence the responses of the participants and results in any certain direction.

The Social and Human Sciences Research Ethics Committee of Istanbul Technical University approved the conduct of this work. (Date: 09/05/2023).

1.3.1 Sample

As this study aimed to capture experiences of professionals from different backgrounds especially in knowledge based areas, individuals from such relevant fields were included in the research. Similarly the reason for interviewing people working in different professional fields and from different backgrounds was to obtain as much as possible about how ChatGPT is altering and transforming the concept of productivity in different contexts. In my research, I conducted 8 semi-structured

interviews from different professional backgrounds including academia, marketing, software development and English Language teaching, by using open-ended questions to collect data. The users who were interviewed ranged in age from 25 to 31 (mean 28), had undergraduate, master's, and doctoral degrees, and were made up of three males and five women. (see Table 1)

Table 1. Demographic Details of the Participants

Interviewees	Sex	Age	Education	Profession
Participant 1	Male	26	Bachelors Degree	Computer Engineer
Participant 2	Female	25	Masters Student	English Teacher
Participant 3	Male	31	Bachelors Degree	Software Developer
Participant 4	Female	29	Phd Student	Academic Staff
Participant 5	Male	26	Bachelors Degree	Business Development Specialist
Participant 6	Female	28	Masters Degree	Environmental Science Researcher
Participant 7	Female	27	Bachelors Degree	Digital Marketing Specialist
Participant 8	Female	30	Phd Student	Editor

1.3.2 Analysis Technique

The qualitative data gathered through this method was analyzed with thematic analysis manually since interviews aimed at investigating the experiences, ideas, opinions and perceptions of the participants. Before starting the analysis, the transcripts were read twice to gain a thorough understanding of the data. According to Creswell (2012), checking and reviewing the transcripts numerous times to ensure that you have not missed anything indicates a high level of data dependability. So prior to transcribing each interview and later, I went through the results several times to consider similarities and differences across the interviews as well as connections to what I had read in prior research.. Lately, the themes that I found were categorised as ‘Enhancing Aspects of ChatGPT’, ‘Limiting Aspects of ChatGPT’, ‘Relationship between ChatGPT and Users’ based on repeating patterns from the data, which were codified. (see. Appendix 2). These themes were explained and discussed in the upcoming chapters of ‘Results’ and ‘Discussion and Conclusion’.

Chapter 2: Theoretical Framework

2.1 Posthumanism and its Relevance to Human Enhancement

Creating a definition that fully encompasses the intricate and abundant aspects of posthumanism is a difficult task. Ihab Hassan is widely recognized as the first author to use the concept of posthumanism in his writing, specifically in his work titled "Prometheus as Performer: Toward a Posthumanist Culture?" which was published in 1977. However, contemporarily, posthumanism has become an umbrella term used by different scholars to denote and emphasize various meanings. What they have in common is that at its core posthumanism acknowledges the interconnectedness of all things and recognizes the blurring of boundaries between human and non-human,

similarly natural and artificial and physical and digital domains. It questions established ideas of what it actually means to be human and scrutinizes the concept of posthuman or transhuman states where the natural limits of a biological human being is extended or even surpassed.

I find using posthumanism as a lens useful and significant for many reasons.¹ When I first read and learned about posthumanism, seeing the fact that it recognizes that humans are interconnected with other entities in complex ways, including machines, animals, and the environment has been quite enlightening indeed. Posthumanism challenges the traditional idea that humans are distinct and superior to the natural world and other beings. Therefore we should note that this framework encourages us to have a broader and more inclusive perspective that transcends anthropocentrism and embraces a far-reaching approach to understanding and interacting with the world around us. Given that the world today is surrounded with the highly critical challenge of environmental crisis - which most likely arose due anthropocentric policies and behaviour - this viewpoint actually makes a lot of sense. To reiterate, posthumanism investigates the idea of a world beyond anthropocentrism, in which humans and non-humans cohabit and interact, blurring the line between natural and artificial, human and non-human, and biological and technical worlds. This calls into question traditional boundaries and compels us to reconsider our interactions with the planet and its nonhuman agents.

¹ As Forlano says that “the hybridization and enhancement of humanity are inherited in the posthumanistic approach, which has blurred the boundaries between human beings and non-humans” (2017). In that regard, investigating any scenario where human is enhanced or hybridized with a technology, posthumanism becomes a highly relevant lens.

Accordingly a famous posthumanist figure, Donna Haraway argues that beings do not exist independently but are instead shaped by the relations they form within the world (Haraway, 2003). In other words, beings are not pre-existing entities, but rather are defined by the relationships they establish. Another prominent scholar in the field, Rosi Braidotti (2013) emphasises the fact that today we are undergoing a major transformation driven by advances in technology and this in parallel changes our understanding of ourselves and the world around us - or at least it should lead us to do so. In her work 'The Posthuman' Braidotti (2013) says:

"We need to devise new social, ethical and discursive schemes of subject formation to match the profound transformations we are undergoing. That means that we need to learn to think differently about ourselves. I take the posthuman predicament as an opportunity to empower the pursuit of alternative schemes of thought, knowledge and self-representation. The posthuman condition urges us to think critically and creatively about who and what we are actually in the process of becoming" (p. 12).

There are two important concepts related to the idea of posthumanism: 'materiality' and 'reflexive approach'. Posthumanism highlights the materiality of technology, meaning it emphasises that technology is not simply a tool or an extension of human agency, but a complex and dynamic entity that has its own agency with the potential to affect the world in unpredictable ways. In a sense, posthumanism presents a framework for analyzing the social consequences of technology advancement. Posthumanism helps us to comprehend how technological innovations are transforming the way we think about ourselves and our role in the world by realizing that technology is not neutral, but rather enmeshed in cultural and social frameworks.

In the existing case, we need to take the materiality of ChatGPT into account so that we can better understand its potential impacts on human behavior, cognition, and social and economic relations and develop more nuanced approaches to ethical and social implications of its use. If we think about it, we already see that ChatGPT has the potential to bring about these unpredictable changes, with speculations around its potential for eliminating countless jobs and roles. The effect and perplexity it created on academic community is also a similar effect and phenomena.

As for reflexive approach, we can say that posthumanism encourages to have a reflexive approach to technology and the non-human world. That is to say there exists a need to constantly question and re-evaluate our assumptions and values in light of technological developments and we should be aware of the ways in which technology shapes our identities, values and perceptions. Considering that there is a huge discussion about how ChatGPT can alter various professional domains, education and research, again this approach holds water.

Posthumanism is very much related and relevant to the concept of 'human enhancement' because as we discussed earlier, it allows us to consider possible scenarios where human being exceed their natural limits and boundaries. It also investigates the effects and ethical concerns of the possible future convergence of humans with advanced technology such as AI and human enhancement technologies. Human enhancement is such an old story. Even Adam and Eve desired it (especially the cognitive enhancement offered by the knowledge tree) and by ancient times, the prevalent enhancements had already advanced to a high level of complexity (Kourany, 2014). Before explaining them in more detail let's first define the term:

Human enhancement is the use of technology, tools or other interventions to increase a person's capacity to do a certain activity or function. In other words, human enhancement “refers to all the new ways promising to enhance human potential” (Porpora, 2019).

Going back again in history, we see different forms of enhancement. For instance, carbonized human hair was used in places such as China to speed up the natural healing process of illnesses such as burns or wounds. Similarly, perfumes were used in ancient Egypt to enhance dream experiences, reduce anxiety, and alleviate sadness (Gupta n.d.; Keville & Green, 1995). These were all examples of enhancement and significant advances were accomplished throughout the Middle Ages, including the invention of armor and weaponry. The contemporary period offered even higher advancements, such as computers, smart phones and increasingly sophisticated microscopes and telescopes to advance human capabilities. However, in the twenty-first century, we can say that the anticipated enhancement surpass all prior accomplishments. Those who are in favour aspire to nothing less than a whole redesign of the human person, embracing both the body and the intellect, with the goal of exceeding all inherent human limits (Kourany, 2014). If these aspirations taken to the furthest, the outcome will be "posthumans," who are humans with drastically altered capacities that they will no longer be ordinary human at all. (Ibid, 2014). As posthumanism encourages critical engagement with the results and questions which might arise from such advancements - like social, ethical, philosophical and existential considerations - it serves as a highly compatible and meaningful theoretical framework to deal with this research subject.

Chapter 3: Literature Review

3.1 AI and Human Enhancement: Conceptual Overview

Enhancing human skills in the context of human-computer interaction could involve employing computer programs, algorithms or artificial intelligence to aid or enhance human talents. As a result we see the sub-topic of AI and human enhancement which is a complex and multifaceted domain and there are varying opinions on this subject. Some scholars are in favour of utilising AI to this end, namely for the purpose of human enhancement and they believe that AI has the potential to greatly improve human skills through boosting cognition, improving decision-making and increasing our physical capabilities. Others have expressed worries about the implications of artificial intelligence for human augmentation, notably in terms of ethics and social justice. Among major issues is health and safety related risks. Some others are concerned that AI-powered improvements may worsen current socioeconomic inequities by leveraging those who can afford them, while others are concerned that enhancements could harm human identity and autonomy by blurring the lines between humans and machines. How far advanced is artificial intelligence? What can we anticipate for the near future? These queries underlie a good deal of related anxiety and philosophical inquires.

These concerns however do not prevent ongoing and dense efforts towards human enhancement by AI. Today brain scientists, neuroscientists, software developers and biologists are all contributing to the AI field by employing AI technology to enhance human potential and vice versa. For example, Hanson Robotics has already created andro-humanoid robots and human astronauts are being replaced by humanoid robots in future space trips by space agencies such as The National Aeronautics and Space

Administration (NASA). (Nath and Manna, 2021) . So this amalgamation between humans and artificial intelligence is becoming more common and as Kurzweil claims “it does seem like the singularity is near ” (2006). So as Nath and Manna says “sooner or later, we shall get a different conception of ‘biological human being’ through the advancement of artificial intelligence (AI) technology” (2021).

Obviously a significant dimension of this subject is cognitive enhancement. Cognitive enhancement may be defined as the “amplification or extension of core capacities of the mind through improvement or augmentation of internal or external information processing systems” (Bostrom and Sandberg, 2009) and it can be achieved through different means. The variety of possible internal biological enhancement has continually expanded along with the advancement of cognitive neuroscience (Farah et.al, 2014). Medical and psychological therapies, as well as external technical and institutional systems, are part of the cognitive enhancement spectrum. Cognitive enhancements, as opposed to limited skill or knowledge upgrades, strengthen basic cognitive capacities. Education and training, which attempt to improve general mental skills, are the most popular and oldest means of cognitive enhancement (Bostrom and Sandberg, 2009). Human enhancement research especially in the context of cognitive enhancement serves two purposes in terms of bolstering economic growth. First of all, it contributes to scientific progress, and thus fosters economic development. Second, by extending human capacities, it allows individuals to improve their cognitive, physical, and emotional skills, resulting in greater productivity among employees. Furthermore, it enables experienced and elderly people to continue in the labor force while successfully using their skills.

3.2 Knowledge Economy and AI's Productivity Effect

Powell and Snellman say that knowledge economy can be defined “as production and services based on knowledge-intensive activities that contribute to an accelerated pace of technical and scientific advance, as well as rapid obsolescence” and they highlight that a fundamental element of a knowledge economy is a reliance on intellectual capabilities rather than tangible assets or natural resources (2004).

In recent decades, there has been several studies which investigate the productivity and employment effects of technological innovations on organizations. Productivity, which is a measure of a technology's economic impact, is predicted to increase as a result of technological change (Yang, 2022). However, as Mohnen and Hall (2013) also reviewed and argued, numerous types of innovation, product, process, organizational, and marketing innovations, all contribute considerably to company productivity, whereas some research show little or a negative link between them.

Previous studies show innovative AI landscapes demonstrate similar trends; the biggest development in AI occurred in the previous five years and is monopolized by China, the United States and some other Asian countries such as Japan, South Korea. Although AI innovations are mostly centered in the telecommunications, software services, and electronics manufacturing sectors, there are strong indications that practically all other businesses are progressively capitalizing on the potential provided by AI technology. (Damioli et.al., 2021). A growing number of businesses have seized these opportunities. Google now describes its priority is "AI first," while

Microsoft CEO Satya Nadella calls AI the "ultimate breakthrough" in technology. Their confidence about AI isn't simply empty slogans. They are investing largely in AI, just as the major players like Apple, Facebook, and Amazon also do (Brynjolfsson et al. 2019).

Generally speaking there seems a concord among scholars about the surging trends and transformative effect of Artificial Intelligence, however there are ongoing disputes about its economic impact and value for productivity, echoing the issues embodied in the well-known Solow's paradox "You can see the computer age everywhere but in the productivity statistics" (Solow 1987, p. 36). Optimistic scholars assert that the disruptive content of AI technology, as utilized through task automation, uncertainty reduction, rearrangement of existing and generation of new innovations (Agrawal et al. 2019, Cockburn et al. 2019), will have a productivity-enhancing impact (Brynjolfsson et al. 2017). Other theoretical approaches, on the other hand, predict that the current productivity slowdown will likely continue due to higher inequalities (Gries and Naudié, 2018), learning costs (Jones 2009), and AI's lower rate of disruptiveness compared to other general-purpose technologies (Gordon 2016, 2018).

All in all, AI is gradually becoming a vital technology support for everyday social life and economic activities (Naimi-Sadigh et al., 2021). AI-related activities, it is argued that, will be the driving force behind future economic development, resulting in major adjustments in the structure and approach to production, as well as in the amount and quality of consumption (Vyshnevskyi et al., 2019).

3.3 ChatGPT: Characteristics and Applications

Chat GPT-3 is a highly advanced AI model published by Open AI, an AI research and deployment company. GPT-4 is successor of GPT-3, with only some novel features that further advance the software's capacity (Hughes, 2023). The existence of such machine learning applications is not new. Personal voice assistants such as Siri and Alexa are some previous examples of them. These models can significantly reduce the time spent on manual searches and organizing information. However, one of the major features what sets ChatGPT apart from other machine learning models is its conversational interface. “Experts consider therefore that it wasn’t an development in AI per se but a change in how the AI interacted with people that caught the attention of the world” (Luria, 2023). And when it comes to what makes it a highly efficient one is its architecture. The basis of ChatGPT’s architecture is known as Generative Pre-trained Transformer. The term "Generative" or "G" in the GPT acronym refers to the tool's ability to generate text. A generative model is a type of model that creates new data, contrary to solely classifying or estimating based on input data (Pavlik, 2023). The "P" in the GPT acronym refers to pre-training, which indicates the technique of using a model from one machine learning task to train another model, similar to how humans use prior knowledge to learn new things (Ibid, 2023). ChatGPT provides a vast amount of text for pre-training purposes. And lastly, the neural network represented by "T" stands for "Transformer," which examines the relationships between every component of a given data series (Abid Haleem, Javaid, & Singh, 2022).

The owner of this product, OpenAI has been actively engaged in this field for several years. Their focus has been on initiatives that aim to advance the capabilities of AI

and explore its social implications (Abid Haleem, Javaid, & Singh, 2022). Open AI executives have consistently mentioned that their primary objective in developing this product is to enhance people's lives by creating a useful tool. Likewise on its introduction page, Open AI presents itself as follows: “OpenAI is a non-profit artificial intelligence research company. Our goal is to advance digital intelligence in the way that is most likely to benefit humanity as a whole, unconstrained by a need to generate financial return. Since our research is free from financial obligations, we can better focus on a positive human impact.” (OpenAI, 2015). Similarly, during a recent TV interview with the ABC News, the company CEO Sam Altman expressed that one of their purposes with AI tools they are currently developing, such as ChatGPT, is to create means for people where they can amplify their skills and abilities (ABC News, 2023).

Meanwhile, it is important to note that OpenAI has been occasionally criticised about their product’s potential harm and also lack of transparency about the latest version, which is GPT4. Previously, OpenAI had acknowledged some limitations of ChatGPT and the fact that it may occasionally produce responses that are incorrect or odd. While ChatGPT can assist with developing creative and imaginative solutions to complex issues, as discussed earlier concerns exist about its potential to replace or compete with human labor, leading to job displacements. In addition to that, ethical issues often come up with respect to using ChatGPT. Since ChatGPT serves as an artificially intelligent instrument and cannot experience emotions, exhibit empathy or make moral judgments, using ChatGPT in industries like healthcare or criminal justice create other forms of ethical dilemmas such as bias. Consequently, it is essential to think through the ethical ramifications of human improvement through

AI technologies, such as ChatGPT, and make sure that it is used in ways that benefit mankind while preserving individual rights and values.

To briefly discuss what could be additional problems that might arise from using ChatGPT, we can mention the possibility of cognitive weakening as well. According to Noam Chomsky, these AI technologies enable “basically high-tech plagiarism” and give “a way of avoiding learning” (Open Culture, 2023). As Kahneman (2011) underlines, engaging in careful thinking demands exertion and effort. Since ChatGPT encourages people to rely on instinctive thinking rather than carefully evaluating information and abstaining from this burdensome activity, it increases the psychological risks related to AI. This is due to ChatGPT's output appearing to be outstanding, which eliminates a lot of the labor-intensive tasks. As a result, when the outcome appears promising, individuals could forego carefully evaluating the details and resort to their own cognitive capabilities. So while experiencing the empowering aspects of this strong tool, it might be difficult to face the opposite side effects. Therefore we might even need to ask: ‘Are we in risk of losing this vital skill of captivating writing, both fictional and nonfictional, by autogenerating content?’. For this reason, my research question and user interviews will also aim to explore to what extent ChatGPT limits our abilities from the users perspective.

Furthermore, there is a risk that the output of ChatGPT could exhibit discriminatory behavior. As mentioned earlier, the problem of algorithmic bias may occur and it can favour certain communities or ideologies over others. Apart from these, perhaps one of the biggest limitations of AI technology is its inability to imitate human-specific abilities such as creativity and empathy. While AI systems are designed to perform

specific tasks, they cannot generate original ideas or understand complex human emotions. Users - with respect to these matters- should therefore confirm information from credible sources before relying solely on the responses produced by ChatGPT. It is also important to note that ChatGPT and other LLMs generate very persuasive writing but are sometimes incorrect, hence their usage has the potential to distort facts and disseminate false information. This may also lead to degrading the quality and transparency of any academic or scientific research and radically change our autonomy as human beings.

The challenges are not limited to the ones above. There is also the risk of access asymmetries to technologies, which researchers will have to tackle when AI systems are included into human-AI hybrid solutions (Rai et al., 2019). There is already a problem with the digital divide in poor countries (Venkatesh and Sykes, 2013), where discrepancies in technology use can contribute to disparities in wealth and well-being. Although systems like ChatGPT are simple to learn and use and their designers will work hard to integrate them into commonplace apps, they can amplify resource inequality. Users who cannot use English (or other languages in which ChatGPT can operate) will suffer as a result of their inability to use the Artificial Intelligence tool, whereas their peers will be able to. Furthermore, access inequality will result in asymmetry in the data used to train and refine these algorithms, with marginalized groups not having their data represented (Chen and Wellman, 2004; Weissglass, 2022). Similarly, as there are differing levels of agency between humans and AI systems (Dattathrani and De', 2022), the use of ChatGPT and other AI systems will raise issues of accountability and responsibility. There will be an imperative to handle questions of blame, responsibility, legal, and financial liability

when ChatGPT is used more often for jobs like coding and planning. Therefore it is encouraged for future studies to define the agentic duties of people and AI systems for various domains and activities.

3.3.1. Human-Machine Complementarity

Noy and Zhang argue (2023) that ChatGPT could improve productivity of workers in two ways and these can come out basically as a result of human-machine complementarity. On the one hand, it could replace worker effort by swiftly generating satisfactory quality product that employees directly submit, allowing them to cut the time they spend on the task at hand. On the other hand, it might supplement employees' skills: people and ChatGPT working together might produce more than the sum of their parts, such as if ChatGPT assists in brainstorming or quickly produces a rough draft, which humans subsequently edit and improve. They explain an experiment they conducted and its signals as follows and underline that this extra complementarity between ChatGPT and the user brings about even better results than the standard output:

“Evidence for the complementarity story could come in two forms: (a) we could observe treatment-group participants choosing to expend significant time editing ChatGPT’s output or repeatedly prompting ChatGPT in anticipation of earning higher grades, and (b) we could observe that treatment participants’ essays receive higher grades than ChatGPT’s raw output, suggesting that human input adds value” (ibid, 2023, pg.5).

3.4 Previous Work on ChatGPT

ChatGPT is relatively a new phenomenon and the existing literature on this related research area especially in terms of philosophical considerations is still limited, leaving ample opportunity for future researchers to make valuable contributions and advancements. It is observed that majority of previous studies on ChatGPT have focused on its potential impact on education and academia, trying to assess both prospective pros and cons of this AI tool. Likewise, natural language processing, healthcare and ethics have been largely discussed general topics with respect to ChatGPT. If we classify the literature based on these overarching themes, one last theme could be applications of ChatGPT in miscellaneous industries.

3.4.1. ChatGPT's impact on Education and research

As education is a concept which is directly related to the intellectual development and enhancement of human beings, studies exploring the intersection of education and ChatGPT are crucial to be considered for my thesis. These previous studies primary clearly indicate that ChatGPT has a serious potential to transform this field and improve learning experience of individuals. For example, Lund, B.D. and Wang, T (2023) have considered and discussed the ways ChatGPT can potentially advance academia and librarianship and they consequently have found out that there are both alarming and fascinating implications of it. In their paper, they highlighted that a number of ethical issues may come up with the increasing use of this AI technology and bias, privacy, intellectual property, autonomy and informed consent have been listed by them as the major ethical issues. Meanwhile they have presented that ChatGPT can contribute to the advancement of academia by providing service and

ease in various ordinary and time-consuming tasks such as data analysis, text generation, literature review, translation and much more.

Likewise, Frieder et al.(2023) have examined ChatGPT's educational skills, specifically in mathematics such as its ability to creating accurate simple statements, responding to maths-related enquiries and solving maths problems. Their experiment findings have demonstrated that ChatGPT outperforms other models in terms of creating mathematically correct statements and solving maths problems. (Frieder et al, 2023). Overall, we can conclude that these studies focusing on the subject of education uniformly signal the positive and enhancing aspect of ChatGPT and how it might contribute to the better performance of individuals in various realms even though it might in parallel lead to some societal and ethical issues such as plagiarism and authenticity.

3.4.2. Ethical Implications of ChatGPT

Given that my thesis also deals with the ethical implications of the usage of ChatGPT within the context of human enhancement, reviewing prior studies dealing with the topic of ethics is also important. Such research can provide valuable insights and perspectives. In that regard, we observe that ChatGPT has been largely discussed in the field of ethics because of its varying potential influence on society. Dis et. al. (2023) for instance, highlighted that it is critical for the scientific community to discuss the ramifications of this potentially revolutionary technology. Accordingly, they have outlined five important (mostly ethical) challenges and shared their recommendations about where to begin to address them.

The first point which they stress is the need for holding on to human verification about ChatGPT's output. Explaining that they gave ChatGPT a series of questions and assignments that needed a thorough comprehension of the literature and they realized that ChatGPT occasionally created inaccurate and misleading results. Dis et al. (2023) argue that some false or biased information can be reflected to a researchers' thinking and writing whether consciously or unconsciously. Therefore they suggest and that high-quality journals should be extra cautious and require human verifications/reviews or maybe even prohibit the usage of Large Language Models (LLMs). This should be done to avoid over-reliance on automation and to emphasise the significance of responsibility in scientific activity. From their perspective, human beings must maintain accountability for scientific practice by all means.

The second point that Dis and his colleagues highlight is that there should be rules developed for accountability in scientific research such as research articles, author-contribution statements and acknowledgements should identify clearly and explicitly whether and to what degree the authors employed AI technologies in the creation of their text and analysis. Thirdly, given that OpenAI is mostly funded by Microsoft and other major tech companies are competing with each other to provide rival tools, the lack of transparency becomes a major ethical challenge. Therefore the authors advocate prioritizing the development and deployment of open-source AI technology to solve the lack of transparency in the arena. They suggest -as universities lack the resources to keep up with the rapid pace of development- other

main organisations should make investments in independently development of advanced, open-source, transparent and democratically controlled AI technologies.

The fourth issue is about the fact that, with AI chatbots completing and fastening many research tasks, we can see the acceleration of innovation and major breakthroughs across many disciplines. Therefore they underline that in that regard, we need to debate the trade-off between the benefits of AI and the possible loss of human potential and autonomy in the research process. Lastly, in light of LLMs' potential for disruption, they recommend that the research community must convene and debate the trade-off between the positive and negative implications of AI. Also discussing the ways to create open-source AI technologies which guarantee accountability and transparency should be a priority in their perspective. Assessing all these five points and recommended steps to address these ethical challenges, I have found them very reasonable and useful because all these points not only apply to challenges which could be encountered in the field of research but also to any other sphere where ChatGPT is used for the purposes of gathering information and knowledge production.

3.4.3. Applications of ChatGPT in Different Sectors

When we consider the literature which deals with various application of ChatGPT in different sectors, we realize that it has several potential uses in different industries, notably in healthcare, customer service, marketing etc., where it may enhance productivity of the relevant workers and professionals, increase customer happiness and give important insights to businesses of all sizes. Likewise, in a brief article

titled 'ChatGPT: Future Directions and Open possibilities', Mohammad Aljanabi (2023) explores possibilities and open opportunities for this technology to improve our lives in various sectoral fields including healthcare and finance. He mentions that a promising future direction for ChatGPT could be its integration with other AI technologies, such as computer vision and robotics. He highlights that the integration of ChatGPT with such systems can revolutionize the way we engage with technology by building intelligent and conversational AI systems that can better comprehend and respond to human speech. This connection also has the potential to improve natural language creation while offering an even more seamless user experience in our daily interactions. As the accuracy and capacity of these models to grasp and answer to complicated issues increase, it could also bring about innovative applications in critical fields such as healthcare and finance where enormous volumes of data generally require being analyzed. With respect to potential negative consequences he touches on similar concerns such as elimination of jobs and privacy issues associated with data collection (Aljanabi, 2023). As mentioned earlier, many different studies present how ChatGPT can be of great use and simplify certain tasks in healthcare as well. For example, Jeblick et. al.(2020) employed a natural language processing system based on ChatGPT to simplify radiological reports, which ultimately provided excellent accuracy in both content comprehension and grammatical correctness. Their findings signalled that simplified reports were found to be more accessible and easy to understand by laypeople. The study, however, was limited in the sense that it included a small sample size and lacked extensive analysis, as well as an assessment of the accuracy of the simplified reports and information on the technology's potential influence on medical treatment or patient outcomes. To summarize, the research looking at the application areas of ChatGPT in diverse

sectors indicate that it has significant potential to increase professionals' capabilities and contribute to their productivity.

3.4.4. Comprehensive assessment of ChatGPT as an NLP tool

Another crucial and relevant study which I would like to mention is the study conducted by Koubaa et al. (2023). This study is the first critical review of ChatGPT literature and offers a comprehensive assessment of ChatGPT, covering its technical advancements and its position in the field of conversational and generative AI. This study also deconstructs the aspects that enable ChatGPT's high performance and capabilities by studying its accomplishments, classifying recent research, and comparing it to rival tools. Koubaa and his colleagues explain that there are several factors which make ChatGPT superior and more efficient compared to early chatbot systems, namely: its capacity to comprehend broad contexts in natural language conversations due to its advanced model, the large scale training behind it to create more natural and engaging responses and its ability to produce high-quality and diverse text outputs, through its powerful transformer architecture (Ibid.,2023). Furthermore, the study has investigated ChatGPT's obstacles and limits, displaying areas for development and unexplored research prospects. The authors deal with major ethical challenges with respect to ChatGPT in more detail and discuss them extensively. First off, they point out that the problem of data privacy and ethics for ChatGPT is a complicated and multifaceted one. Protecting the personal information acquired by ChatGPT is a critical part of this problem, as it relies on massive volumes of data to train its language model, which often consists of sensitive user information which might be leaked through hacks (Ibid.,2023). Another facet of the

data privacy challenge for ChatGPT pertains to ethical considerations. Given that ChatGPT has numerous potential applications, such as in social media, online communication and customer service fields, its capabilities also raise ethical concerns in areas such as spreading false information and manipulating individuals (Ibid.,2023). They emphasise that in order to tackle these issues, researchers and developers must include robust data privacy and security mechanisms in the design and development of ChatGPT. Encryption, data anonymization and access control methods all might be used in this process. Furthermore, they emphasize that ethical guidelines, such as setting rules for appropriate usage and ensuring technology deployment transparency should also be included in the development process (Ibid.,2023).

3.4.5. ChatGPT's Biggest Disruption: Knowledge Work Productivity

Another noteworthy and highly informative work titled "So What if ChatGPT Wrote It?" was published by Dwivedi and his colleagues. (2023). It is a remarkable text because as a multidisciplinary study, it provides a comprehensive understanding of the opportunities and challenges which ChatGPT may bring. This editorial opinion paper features contributions from 43 experts from numerous fields, including education, computer science, marketing, policy and nursing. These experts acknowledge ChatGPT's ability to improve productivity while also discussing the ethical and legal implications that come along with its use. This study has been particularly useful and insightful for my idea formation and writing because two closely related concepts to my research question, namely knowledge production and human-AI partnership have been tackled by two different contributing authors in

separate sections of this study. Therefore I will extensively discuss these two sections.

In the section, ‘ChatGPT’s Biggest Disruption: Knowledge Work Productivity’, its author Michael Wade makes a bold statement and says that “In fact, I believe that the biggest potential source of disruption will be ChatGPT’s effect on the productivity of knowledge work ”(2023). He explains these related concepts and says that knowledge production is a valuable phenomenon and productivity may be evaluated in two ways: task completion time (efficiency) and output quality (effectiveness) (Ibid, 2023). He underlines that ChatGPT can significantly enhance productivity in knowledge work by optimizing and simplifying the information search process and other related mechanisms. He reiterates that the most substantial effect of ChatGPT is likely to be providing a proficient first draft for commonly performed written knowledge tasks. Since productivity is very much related to and part of the human enhancement concept, I should mention that his remarks generally have provided meaningful insight for my assessment.

3.4.6. ChatGPT and Human Hybridity

The second author which I earlier referred to, Alexander Richter raises a very similar and pertinent point to my thesis topic. In his section “ChatGPT as a Member of Hybrid Teams”, he argues that the idea of humans and AI working is not a new one in the field of AI and AI pioneers have recognized the potential benefits of such a collaboration much earlier (Dwivedi et. al., 2023). He underlines that they envisioned a symbiotic connection between people and AI in which AI would supplement

human intellect, aid in complicated problem solving, and help in making better judgments, eventually assisting humans in achieving their goals more effectively, referring to Licklider's scholarly work in 1960. Richter then continues to look at the various possible scenarios where ChatGPT can play a role in a team that includes both humans and AI, such as the role of a coach, innovator and software developer. (Ibid, 2023)

Richter talks about the examples where AI-based coaches can assist people in learning new behaviors and techniques by working with them to plan, monitor and regulate their thoughts, feelings and behaviors. He explains that AI can serve as a coach to assist people keep track of their wellbeing and manage their time more thoughtfully to improve attention. He also mentions that according to Bouschery et al. (2023), GPT-3 can operate as an innovator in hybrid innovation teams, resulting in greater innovation performance by allowing for broader issue and solution areas. The generative functionality of ChatGPT allows it to contribute fresh concepts and ideas by completing words, paragraphs, or entire documents in accordance with a given context and problem specification (Stevenson et al., 2022). Regarding this, Richter underlines that although it may not generate as many unique and valuable ideas as humans, it can still assist human team members in better understanding their problem and solution space (2023).

Richter also talks about how AI can take the role of a software developer in a hybrid team. He explains that some software teams already use ChatGPT for several purposes in coding by automating processes like as code creation, testing and bug fixing during the development and post-deployment stages. He argues that

understanding how AI could help with different teamwork tasks may deepen the conversation about hybrid work and proceeds to say that:

“So far, the term hybrid work has been mostly limited to the traditional binary of presence work vs virtual work. The addition of AI to collaborative teams warrants to re-consider the term and concept of hybrid work. Hybrid work is no longer limited to the continuum of presence and virtual but also comprehends the duality of human/human vs human/AI.” (Dwivedi et al, 2023, pg.7)

By offering these examples, overall he underlines the emergence of hybrid teams comprised of human actors and AI. Based on this perspective, he concludes that these new relationships bring about new questions about many issues such as reliability and accountability. Some examples of these questions might be “How should tasks in workload be divided between AI and humans or who assigns/organizes these tasks? ” And this actually leads to an even broader question : how can AI and humans work together to utilize their respective strengths to the fullest? (Bernstein et al., 2022). In sum, the points made in Richert’s writing truly make sense and contribute to my grasp of the topic because this hybridity and symbiotic bond between humans and AI is also in a sense what I look into with my research subject and I mostly agree with the argument that we can and will see more and more of this type of hybrid work consisting of AI and human.

Overall, previous studies in literature have commonly acknowledged ChatGPT’s potential to improve human beings daily lives, capabilities and therefore their professional or educational spheres while recognizing major common, ethical

problems which might arise from these phenomena . However, based on my individual research there has been almost no specific study which directly dealt with the intersecting subject of ‘ChatGPT and human enhancement’, namely there has been few particular academic work which discussed ChatGPT within the context of human enhancement and in relation to productivity. By looking at this specific topic through the users’ own perspectives and from a posthumanist lens, I am aiming to make a contribution to the literature while synthesising the information gained from prior research.

3.5 AI and Conversational Agents: Understanding the Landscape

To gain a deeper understanding of ChatGPT’s current capabilities and potential impact on society, it might be crucial to understand the history and development of the main and broader technology namely the Artificial Intelligence. Technology is transforming society and the world at an unprecedented pace, revolutionizing it more profoundly than ever before and the origin of these most disruptive changes can be attributed more and more to the rise of artificial intelligence. The recent decade has seen remarkable development in AI, based on the application of contemporary machine learning techniques and large quantities of processing power to massive, sometimes unstructured data sets (Russell & Norvig, 2009).

In the 1950s, a generation of scientists, mathematicians, and philosophers embraced the concept of artificial intelligence (AI). Alan Turing, an outstanding British polymath who investigated the mathematical possibilities of constructing artificial

intelligence, was among them. Turing argued that people solve issues and make judgments using existing knowledge and logic, so he asked that daring question: "Can machines think? (Turing, 2009). This served as the logical foundation for his 1950 work, "Computing Machinery and Intelligence," in which he investigated how to build intelligent computers and how to judge their intelligence.

And the quest to create a machine that can mimic human behavior and performance began.

AI in a sense set out to devise an artificial rival to human intelligence. In its early days, the area of AI research found tremendous backing, including funding from a wide range of thinkers and government funding (Grudin, 2009). However, there have been times of decline known as "AI Winter," but these periods were ephemeral. DARPA (Defense Advanced Research Projects Agency) in the United States has funded AI research for almost 30 years. In the last decade, there have been huge advancements in this field. One milestone incident that is often referenced with respect to AI is when an IBM supercomputer known as Deep Blue defeated Gary Kasparov, the world chess champion in 1997 (Ibid, 2009). Because this was interpreted as a sign that artificial intelligence was catching up to human intelligence and even managed to beat one of humanity's geniuses like Kasparov. As a result, since then AI has inevitably generated a lot of discussion surrounding its risks, benefits, and impacts.

Artificial General Intelligence (AGI), which in simple terms refers to the ability of an artificial intelligence system to learn and accomplish any intellectual task that humans or animals can do is the ultimate aim of AI. As they have a wide range of

capabilities that seem intelligent, programs like Siri, Alexa, and LaMDA are among the first group of programs that are trending towards Artificial General Intelligence, as is ChatGPT. Even though they might not perform as well as professional humans at each activity, their size, speed, and scope are overpowering.

One major and significant product of Artificial Intelligence (AI) has been conversational agents (CAs). AI has enabled the development of these systems which are basically computer programs that can simulate human-like conversations using machine learning algorithms. These agents, usually referred to as chatbots or dialogue systems understand user inquiries, provide responses and participate in meaningful discussions using advanced machine learning techniques. They promise to enhance the user experience significantly by delivering tailored experiences, being available around the clock, and offering quick response times. (De Keyser et al, 2019). While they are getting more widespread and dominant, there are already many industries and fields where conversational agents are highly in use such as customer support, content creation and e-commerce platforms. With the rapid advancements in AI, these tools are becoming increasingly even more sophisticated as could be seen in the case of ChatGPT.

Neural transformer models have become the backbone of conversational AI today (Uszkoreit, 2017). These models are important to mention because they excel in processing longer sequences of data, such as text, through the use of self-attention processes that allow the model to focus on various parts of the input. Large Language Models (LLMs) have emerged as a significant advancement in natural language processing (NLP), built using the transformer architecture. (Teubner et al., 2023).

GPT-3 is one of the outstanding LLMs capable of performing various natural language processing tasks without any fine-tuning. Its largest version has 175 billion parameters and has been trained on an extensive dataset comprising 570 GB of text data, including books, articles, blogs, and other online content, amounting to 300 billion words in total (Brown et al., 2020; Hughes, 2023).

Due to these impressive features, there is also a lot to say about business impact of these conversational agents. Chatbots like ChatGPT are simply the initial phase of a new trend that will see similar chatbots become available over time. Organizations that recognize and embrace this innovation will gain a competitive edge similar to individuals. Google has already announced the introduction of Bard, its own ChatGPT rival. However, it is speculated that since these tools require a large amount of resources, they will eventually become paid services, resulting in a growing digital divide and inequity. After all, “ those who have access to the ever increasing number and variety of enhancements will be healthier, physically stronger and more attractive, cognitively more capable, emotionally more self-assured, and so on, than those who do not have such access” (Kourany, 2014). To sum up, the use of advanced chatbots such as ChatGPT is expected to make a breakthrough in the coming years and has the chance to become a new business paradigm, hence greatly affecting economic outlook. (Dwivedi et. al., 2023).

3.6 Designing Conversational Agents: Considerations and Challenges

As any other technology or product, the design of these agents require careful thought and evaluation and since our subject matter is ChatGPT, we need to tackle

with this dimension of the issue as well. In current literature, there are doubts regarding whether conversational agents adequately address ethical considerations, which could understandably lead many users to be skeptical. This concern is also reflected in the current research on conversational agents, as most authors have not taken a normative approach in developing design guidelines. Instead, they have merely described user interactions with these agents, making it difficult to draw definite conclusions about the ethical design of such agents. (Wambsganss et. al., 2021)

Similarly major tech companies that offer conversational agents, such as Google (Google, n.d.) and Microsoft (Microsoft, n.d.), have recently issued ethical principles for the development of these AI systems. Also, the Organisation for Economic Co-operation and Development (OECD) compiled a set of five ethical guidelines for AI-driven systems, with input from 50 specialists representing 20 governments, as well as figures from the corporate, labor, civic, academic, and scientific fields:

- 1) “AI should benefit people and the planet by driving inclusive growth, sustainable development and well-being.
- 2) AI systems should be designed in a way that respects the rule of law, human rights, democratic values and diversity, and they should include appropriate safeguards – for example, enabling human intervention where necessary – to ensure a fair and just society.
- 3) There should be transparency and responsible disclosure around AI systems to ensure that people understand AIbased outcomes and can challenge them.

- 4) AI systems must function in a robust, secure and safe way throughout their life cycles and potential risks should be continually assessed and managed.
- 5) Organizations and individuals developing, deploying or operating AI systems should be held accountable for their proper functioning in line with the above principles ” (OECD, n.d.).

However, according to Gregor (2020) the available literature seems insufficient in providing meaningful and evaluated design principles to aid information system designers and practitioners in 1) creating value-sensitive conversational agents and 2) evaluating the currently instantiated conversational agents based on these principles from a value-sensitive design perspective. As my thesis will also consider ethical issues related to the using ChatGPT, in discussion section I will try to address these relevant issues for the ethical design of this technology and try to provide beneficial notes and insights on this matter.

Chapter 4: Results

4.1 Introduction

This chapter shows the main findings of the study under three main themes, which were generated through semi-structured interviews with ordinary users of ChatGPT. The Figure below displays the three central themes, which include i) Enhancing Aspects of ChatGPT, Limiting Aspects of ChatGPT and the Relationship between ChatGPT and users., I will present the results of each theme as they were found in semi-structured interviews, in the following section.

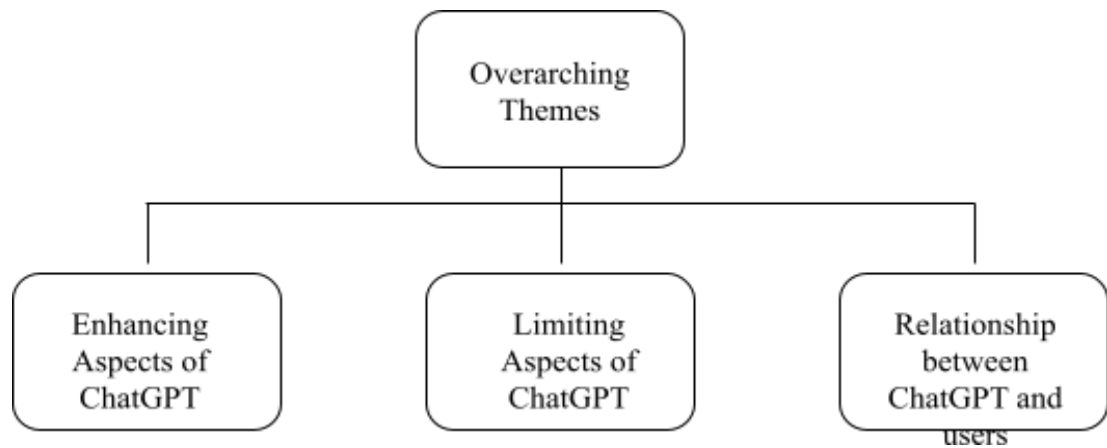


Figure 1: Main themes of the study

4.2 THEME 1: Enhancement

This section, according to the research findings, covers four major topics deduced from the Enhancing Aspects of ChatGPT, which are ‘the general enhancement’, ‘better time management’, ‘learning new information and skills’ and ‘improving creativity’. Below, the findings of four categories will be presented.

4.2.1 General Enhancement

At the beginning of the interviews, when participants (n=8) were asked about the general impact of ChatGPT on their capacity, all of them clearly they responded that it has an enhancing impact on their capability in a positive manner.

Participant seven for example, explained her perspective as follows:

“I can say that it has a very significant impact and a positive one at that (increasing capacity). In fact, I can have really difficult times when ChatGPT is overloaded or not working properly, because it is very helpful in generating English content

especially. It not only helps me learn useful phrases and vocabulary, but it also greatly assists me with grammar rules such as verb tenses and sentence structure”.

Similar to Participant seven, Participant five also commented upon its general enhancing impact on his daily work and tasks by saying:

“I receive a lot of support from ChatGPT in almost everything, for example in producing ideas or getting feedback on my writing, particularly in detecting any wrong use or negative sentiments in my work and receiving suggestions or general assistance related to anything really. It is extremely beneficial to my workflow”.

Apart from ChatGPT’s contribution in fulfilling various tasks such as translation, text writing, code writing, control and correction, it was intriguing for me to discover that people use this AI tool for even many other different purposes of improving themselves and their abilities and experiencing it on a different level psychologically too. Participant six for example said:

“I believe it has truly increased my general capacity, for foreign language learning in particular. Because conversing with a robot is definitely more comfortable compared to a humanbeing. You feel more at ease since you are not being judged about your competency level, there is no positive or negative judgment and you may communicate freely. Therefore, I believe that it has greatly improved my speaking skills.”

4.2.2. Better Time Management

As discussed in literature review, time management is an integral component of productivity, and therefore of an enhancement effect. In the interviews, all the participants acknowledged that a better time management comes along with using ChatGPT. For participant one, for example, utilising ChatGPT in his professional tasks “simplifies this process and saves (him) time, as it provides information in a more organized way. This allows (him) to quickly get answers and find solutions. Therefore, the biggest advantage for (him) is that it simplifies the research process”.

Participant two similarly mentioned that she “uses ChatGPT in many of her tasks such as translation, research and text writing” and she can “handle her work much faster”. Therefore, she thinks “ChatGPT creates a very effective advantage in her life especially in terms of time management”.

Participant four also indicated that *“I believe it has increased my capacity, especially in the context of the purposes I use it for, it helps me understand things much better and more effectively, it pushes me one step forward, and I see that it can quickly present to me something that would take me an hour or two to accomplish in just ten seconds”*.

It was also interesting to see that ChatGPT almost played the role of users’ apprentices who are constantly being assigned tasks and ultimately decrease the amount of time spent on these tasks completion. With respect to that Participant three said the following :

“Now, as far as I can see, the more you work at a high level as a developer, the more beneficial ChatGPT becomes and especially your goals and projects elevate to a higher level. So, let's say we used to adjust projects to our own time before, like let's say I have 20-30 hours a week to allocate to projects. Realistically, these time frames limited the number of projects we could work on. With ChatGPT, that limit is simply removed. So, it actually greatly enhances my abilities because I can delegate all the small task that take up a lot of time to ChatGPT ”.

It was also evident that -unlike humans- with its ability to retrieve information in seconds, ChatGPT specifically plays a great role in minimizing the time spent on research tasks. Participant eight clearly emphasized that "it provides a substantial time-saving" and she “decided to use the ChatGPT often with the intention of quickly obtaining information that may require a specific and extensive search related to her thesis through question-answer interactions”.

4.2.3 Learning New Knowledge and Skills

Learning any knowledge and skills can be recognized as human enhancement because it “offers promising ways to enhance human potential.” (Porpora, 2019).

When participants were asked about if ChatGPT helped them learn new information or skills, majority of them responded that it helped them to learn new information but not particularly skills while two participants referred to both. Participant one said, for example “ChatGPT has definitely helped (him) learn new knowledge and skills” and he “uses it for both (his) software-related work and (his) hobby activities in daily life”.

"I can practically use it for anything since it's a tool that can provide answers for almost everything." (Participant two)

"ChatGPT has definitely sped up the process of my language learning in terms of time and its being free is fantastic. For instance, normally in language learning app, you have to pay a certain fee for an hour-long conversation in a training session, but since ChatGPT provides this service for free, it has provided a great efficiency in this sense." (Participant six)

4.2.4 Creativity

Although creativity is usually considered a human-specific ability, ChatGPT seems to offer to a lot on this to its users since the interview results indicated that some participants perceive a positive impact on their 'creativity' through their interaction with ChatGPT. With respect to that, Participant seven commented as follows:

"If I need to come up with an original idea and I'm struggling, or if I hear something about a field I'm not familiar with and don't understand what is being asked of me, I would normally have to spend hours researching. However, when I ask ChatGPT a question such as "what is this term?" or "how is this done?", it can provide me with an immediate answer and help me generate new ideas more efficiently about any topic".

Participant two similarly said that:

"ChatGPT actually helped improve my creativity. Because I can combine my own creativity with its creativity, I can come up with much more different ideas and take a

much more active role in implementing them because I feel confident that ChatGPT will help me. So it has a motivating and accelerating effect on me when it comes to generatiwng new ideas and taking action on them as well”.

It is important to note that although the participant says that she can come up with new ideas more easily and her creativity is boosted, what she means by creativity might be open to discussion.

4. 3 THEME 2 Limitations

Since the main purpose of the study is also to explore what kind of limitations exist with respect to using ChatGPT, I focused on understanding any limiting or limited aspects with respect to ChatGPT which participants referred to during stage of data collection. In the following sections, I will present the findings about limitations of ChatGPT regarding its impact on capabilities and also its own performance, as found in interviews.

4.3.1 ChatGPT’s Potential Limiting impact on Users Cognitive Capabilities

As we touched upon earlier, engaging in careful thinking requires exertion and effort. Since ChatGPT provides great ease in gathering information and faster decision making, people might rely on instinctive thinking with this output rather than carefully evaluating information (Kahneman, 2011). This accordingly creates some risks related to AI, such as its potentially blunting certain areas of cognition such as memory or attention. When participants were asked whether they experience any cognitive weakening or limitation in such areas such due to reliance of ChatGPT, majority of them acknowledged that they do not feel such an impact at the moment but they have concerns and reservations about this issue especially in the long-run.

According to Participant one, relying mostly on ChatGPT for software developments tasks ‘can create problems for junior developers, especially for young people as it may hinder self-learning’. Also, he believes using ChatGPT all the time may “turn into an addictive tool and create negative, harmful impact” by lessening users' stimulating their own cognitive system.

Participant four similarly shared this concern, she said:

“I still have reservations about this. So I haven't come to a conclusion myself yet, but as I said earlier, ChatGPT offers a lot of information in a very short period of time. Actually, it does increase my capacity, but on the other hand, it makes me think that we are somehow using our brains less”.

This was something that almost all respondents agreed on, that using and relying on ChatGPT might bring about cognitive weakening and limitations, especially in the long run.

“I think it enhances me in the short term, as I mentioned earlier. But in the long term, it may also dull my skills. So we actually use our brains much less compared to the past, I think ChatGPT provides easily accessible information and it's easier for me to use ChatGPT to analyze an article than to do it myself, but in the long run, I think it dulls my own potential. Yes, it helps me in the short term to be more effective in my work, but it doesn't really help me in terms of developing my memory or skills”.

(Participant eight)

“In terms of language skills, I feel like using ChatGPT both helps and hinders my progress. On one hand, seeing certain language patterns again and again gets stuck in my mind, allowing me to use them more easily. On the other hand, it can also hinder my progress by not allowing me to think critically about the language and instead relying on ChatGPT to generate responses for me . Overall, it seems like ChatGPT's effect on my language skills could be considered neutral or have both positive and negative effects”. (Participant seven)

“I'm feeling a little worried right now about the fact that by using this, I might be weakening my own cognitive skills. If there are areas where I need to improve myself, I won't be able to see them because I rely on ChatGPT for everything. I might be left lacking and always relying on ChatGPT, and that could be weakening me”.
(Participant five)

4.3.2 Bias

As discussed earlier advanced AI tools such as ChatGPT poses different ethical questions and one of these major issues is bias. Majority of participants expressed that they have not come across bias problems themselves, however they have seen some examples of it indirectly.

Participant eight explained her own experience by saying:

“I know that ChatGPT's output might be biased in some cases. Even though I have not experienced myself, I have seen several videos that demonstrate biased outputs, particularly targeting Muslims for instance”.

Participant one similarly mentioned that he is aware of potential biases of ChatGPT and therefore “it can be dangerous for people to rely solely on ChatGPT for subjective topics.”, underling that :

“It is not a neutral miracle machine, but a biased one which has learned from a particular group and behaves accordingly”.

He went to explain by saying *“For example, when my sibling asked a common question about American presidents, ChatGPT provided great explanations for some presidents, but for others, it even refused to speak and took a clear political stance”.*

4.3.3. Reliability

Similar to bias, issues related reliability is also among the often discussed limitations with respect to ChatGPT in literature. Participants did not raise this topic very often when they were asked about the limitations however some of them clearly indicated its existence.

Participant three for instance said,

“There is a bit of an issue with trust. There is a problem with reliability actually because failure modes and areas where ChatGPT makes mistakes are very random. So, it's unpredictable where it will make a mistake, which is why its responses need to be reviewed by a humanbeing right now”.

Participant seven likewise touched upon how in some cases especially in “in situations where subjective opinions are needed,” Chatgpt’s output may not be

reliable. She explained that in such cases “Chatgpt can provide something very different or irrelevant”. Participant eight also indicated that for her "the system's biggest disadvantage is that it may contain inaccurate information”. She thinks that ChatGPT “presents everything in the pool of internet knowledge without filtering. Additionally, it doesn't acknowledge when it doesn't know something”.

4.3.4. Credibility

In the interviews with participants, nearly half of them, more specifically three participant mentioned credibility as an issue. Other five professionals chose not to comment on this topic.

For instance, in explaining how she hesitated about relying on ChatGPT’s output, participant six commented that:

"I noticed one shortcoming, which is the lack of references. This made me very hesitant about its credibility, because it is unclear where the information is coming from. I think it would be better if at least some references or links were provided, especially for certain topics. This would make it much more trustworthy”.

4.3.5 Security and Privacy

When participants were asked about if they encountered any security or privacy concerns while using ChatGPT, they uniformly agreed that security& privacy is an issue in their head.

“I have the same level of security or privacy concerns with using Google”.

(Participant one)

"I definitely have concerns about security and privacy. ChatGPT learns from every data you upload to it and if someone else asks ChatGPT a question related to our confidential information or the content of the file I uploaded, it has the potential to reveal what it learned from me". (Participant two)

"It's true that there have been times when ChatGPT has refused to provide personal information, but that doesn't necessarily mean that it doesn't collect personal data. So, I think of it this way: I trust ChatGPT as much as I trust other social media networks". (Participant four)

"There is a very dangerous point in terms of security, called prompt leaking. With certain techniques, you can learn about other people's conversations with ChatGPT. Every week, a new hack is coming out even." (Participant three)

Responses of the participants in the interviews, reveal that they have obviously concerns about security and privacy, especially about some unexpected and relevant problems that might arise in the future.

4.4 THEME 3 Relationship Between ChatGPT and Users

4.4.1 'Right Arm' or 'Mentor'

In the interviews with ordinary users of ChatGPT, seeing it as ‘a right arm’ or ‘a great assistant’ emerged as a theme in both explaining the role and position of ChatGPT from their standpoint. For example, participant one said:

“If I am Ironman, then it's my Jarvis extension. It's like my second arm, a digital assistant.

You can think of it as my right-hand assistant”.

Participant two mentioned that ChatGPT ‘really means everything’ to her by becoming both her assistant and teacher. She said:

“Sometimes I learn so much by asking questions and there's no limit to what it can answer. I ask a question, and it gives me an answer. If I don't know something in the answer, I ask about it and I learn that too. It's like a Matryoshka doll - as you keep opening it up, there's an infinite treasure of knowledge inside. So yes, it's my teacher, my assistant and my search engine all in one”.

However, it was surprising to learn that not all participants mentioned their stance in a similar vein to participant two. Some participants were aware of its limited functionality in their lives and commented accordingly:

Accordingly, participant four said:

“ChatGPT is currently like an academic mentor for me. It's like a helper that makes my life easier when and where it's needed. It knows more than me, synthesizes better, and reaches information faster. It provides me with the correct information in a way

that I can understand in a very short time. It's like a mentor, but not exactly a mentor. For now, that's how it is".

Participant three likewise said

"I see it as an apprentice working for me. It's not entirely a super-intelligent knowledge worker, but if I give it the right task mechanically, it can produce the right work. So, I'm using it as a worker with many activities that are entirely dependent on me. I currently see it as an AI companion or work partner".

"I'm not attributing human characteristics to ChatGPT, but it's an extremely useful tool for me. I see it as a miraculous tool. If I had to say something, I would say it's like my right arm. We have a marketing team. I would say ChatGPT is the third person on the team". (Participant seven)

"I am currently using it as an assistant. Of course, there are other artificial intelligences that can also be conversed with as a friend, but I can say that I am using ChatGPT as an assistant at the moment". (Participant five)

"We have a toxic relationship, and I can't leave it, but at the same time, it's not very trustworthy". (Participant eight)

4.4.2. ChatGPT and User Hybridity for Solutions

When participants were asked about situations where ChatGPT could not handle the task or could not provide a response and how they responded, they generally explained that by modifying their prompts they were able to acquire the information

they asked for and ultimately found a solution to the issue. Participant one, for instance said the following:

“Sometimes ChatGPT fails to learn or understand certain things. For instance, I may want detailed explanations, but it provides summarized bullet points instead or I may ask for something brief and it gives me a lengthy response. However, when I tell it what I actually want it in more detail and points out its mistakes, it immediately corrects itself and responds accordingly”.

Likewise Participant seven commented on this matter and explained how she finds a common ground with ChatGPT by saying :

“Sometimes I encounter technical difficulties. This may be due to my commands in a language that I don't fully understand, which is the language that ChatGPT requires. Therefore there might be miscommunication occasionally and there are times when it doesn't understand me when I use my own language. However, these do not turn into a big issue because when I provide clear and more detailed prompts, ChatGPT understands better and responds then”.

Another participant, Participant two also talked about how she in a sense co-operated with ChatGPT in situations which require original thinking and implementing the ideas.

She said :

“ChatGPT did improve the quality of my work, yes, but there is something else which I definitely want to mention. ChatGPT actually helped improve my creativity.

Because I can combine my own creativity with its creativity, I can come up with much more different ideas and take a much more active role in implementing them.

Because at the end of the day, I know that ChatGPT will help me. So it has a motivating and accelerating effect on me whenever it comes to taking action.”

4.4.3 Chatgpt’s Role in Knowledge Production:

The interview questionnaire included a major question about how the users were thinking about the overall role of ChatGPT in knowledge production. Nearly half of the participants thought that ChatGPT has a limited role in knowledge production since it does not generate new information but rather only provides what it is fed with or based on prompts.

“So, its role in generating information is based on my guidance. It has the ability to generate information but it's under my control and guidance”. (Participant one)

“I don't think it is entirely accurate to say that ChatGPT can generate new knowledge or declare something based solely on its output without human oversight because it is something which humans created”. (Participant two)

“ChatGPT does not provide such creative information. In fact, it simply synthesizes information that already exists on Google or other platforms and presents it to us in a very efficient and effective manner. It can provide this information quickly and in a synthesized form. However, we should note that it also feeds on prompts provided by people. Therefore, we cannot say that it produces information on its own.” (Participant four)

However the other half believe that even if ChatGPT cannot produce new or original information, by simplifying the research process and synthesising the existing body of information, it does contribute to and plays role in knowledge production. One participant specifically mentioned ChatGPT will play an even more significant role in that sense in the near future.

“I would say it has a role in knowledge production, but it's a relatively limited role based on the data it's trained on”. (Participant five)

“In terms of knowledge production, ChatGPT currently handles most of the time-consuming part of any information related task by comprehending existing information and producing new information from it or automating the process of comprehending existing information. I believe that it will have a much greater impact in the future in this sense. In fact, its greatest impact could be understanding existing knowledge and conveying it to people in a way they can understand.” (Participant three)

Chapter 5: Discussion and Conclusion

5.1 Interpretation of the Results

The main purpose of this dissertation was to explore the users' perceptions of ChatGPT's role in enhancing or limiting their capabilities as these aspects would be a critical component of productivity especially in the context of cognitive enhancement and knowledge production. While investigating these subjects, I also aimed to

understand the nature of the relationship between them (ChatGPT and users) and ethical issues which may emanate from this interplay.

The research met its goal by investigating a small group of professionals and their interactions and experiences with ChatGPT through semi structured interviews. The completed interviews were analysed and three key themes were presented in Chapter 4, Results. These main themes highlighted in the previous chapter were 1) Enhancing Aspects of ChatGPT, 2) Limiting Aspects of ChatGPT 3) The relationship between ChatGPT and users. In this final chapter, I will explain the findings in conjunction with the ideas presented in the earlier studies indicated in the literature review.

5.2 Discussion of Key Findings in Relation to Research Question

Building on the themes mentioned in Results chapter, this section will analyse the findings in relation to the study's research question which was 'To what extent does ChatGPT enhance or limit human abilities from the perceptions of ordinary users?' Meanwhile, this study also aimed to explore the nature of the relationship between the ChatGPT and its users in this interplay, along with the relevant ethical implications.

ChatGPT, as an advanced, generative AI tool is expected to transform many areas of our lives, especially the future of work. In relation to that, a growing body of literature estimates the productivity effects of AI on professions or tasks and these studies often acknowledge that ChatGPT substantially raises average productivity by enhancing individuals' capacity. As Michael Wade noted productivity may be

assessed in two ways: task completion time (efficiency) and output quality (effectiveness). And with the research conducted, the results indicate that indeed users experience a direct and positive enhancement in their capacity to a large extent also based on these two metrics, therefore witnessing higher productivity especially with respect to their professional tasks. All of the participants involved in the study clearly stated that they ‘are able to handle and complete their work much faster and efficiently with the help of ChatGPT’ and their responses were consistently more concerned with the advantages it offered rather than its limitations. Most of them expressed that they utilised ChatGPT ‘in almost all of their tasks’ and reached higher quality in a shorter time period. Researching any small or big subject, reaching compact, mostly accurate and relevant information in a very short period of time totally transforms and enhances users’ knowledge production process from their standpoint. They uniformly highlight this impact while also noting that they ‘experience real difficulty when ChatGPT does not function or is not available’. As with the output ChatGPT offers people can understand things much better and decide on their next step, consequently they also experience an improvement in decision making mechanisms and situations. This obviously corresponds to another form of cognitive enhancement.

Previously we mentioned that Richter talked about how AI technologies can assist people in keeping track of their wellbeing and manage their time more effectively. This was exactly what the participants mentioned over and over again during the interviews. They consistently highlighted that ChatGPT creates ‘a very effective advantage in their lives especially in terms of time management’. Some even

mentioned that in their workload ‘the limits which earlier existed are now simply removed’ as they can assign many of their time-consuming tasks to ChatGPT.

As a component of cognitive enhancement, we should also discuss the phenomena of learning new knowledge or skills. Likewise, all of the participants in the research highlighted that they are able to learn new information or knowledge very easily by using ChatGPT as this tool allows them to conduct research in a blink of an eye. Moreover, this enhancement could be achieved in various domains, such as learning a foreign language. With respect to that, one participant mentioned that ChatGPT becomes even more beneficial and effective to this aim because it never judges, gets tired or frustrated with her learning process.

Earlier we also discussed how ChatGPT can operate as an innovator in hybrid teams, resulting in greater innovation performance by allowing for broader issue and solution areas (Bouschery et al. (2023). In relation to that, what certain participants said about creativity is highly relevant and meaningful because they argued that by building upon the output ChatGPT generates, they are able to come up with original and new ideas, therefore can innovate more easily in a sense. One participant especially stressed that this ease encourages her to try new things or immediately get into work and this exemplifies the boosting and enhancing effect of ChatGPT in regards to creativity.

Apart from the enhancement impact, our research question also aimed to understand the ‘limiting’ or ‘limited’ aspects with respect to ChatGPT from the users’ perspective. First off, regarding any limiting effect, whether it be a cognitive

weakening or restriction, majority of the participants indicated that ‘they do not experience such an influence at the moment but they have concerns or reservations about this in the long term’. However unlike the topics which were related to enhancement theme, the participants did not elaborate on this issue or related questions posed to them. As for the limited functions of ChatGPT itself, all participants were aware that ChatGPT cannot tackle with certain types of information or tasks. They have also some concerns ethical limitations it creates such as security and privacy. However, the interview results have shown that individuals come up with methods and ways to overcome these situations where ChatGPT cannot function properly and they somehow manage to reach to a solution or conclusion, therefore eliminating these limitations in a sense.

5.3 Theoretical Implications

Applying posthumanism as the theoretical framework has been helpful in describing and understanding ChatGPT’s role and impact and especially the entangled relationship between human and technology. The results of my interviews assured me that people have already a tendency to see this AI tool as their extension by calling it as their ‘right arm’, also indicating that there is such a dynamic, two-way relationship between them as posthumanism emphasize. It is also obvious that in situations where users face a technical or general obstacle, they do alter their commands, get engaged with ChatGPT in a different approach and ultimately reach a conclusion or solution. This again beautifully exemplifies the entangled, dynamic relationship between human and technology. Some of the participants expressed that ‘ChatGPT is a mentor for them, which helps them to navigate certain issues or

problems'. With this instance, we can even discuss the potential agency of ChatGPT because with the information and responses it provides, it bears the possibility of influencing and directing a human beings' agency and decision.

Posthumanism also helps us to comprehend how technological innovations are transforming us and our boundaries. With the enhancement effect which LLMs like ChatGPT creates, human beings especially in the cognitive sense improve and surpass their natural limits, arriving in a posthuman condition. In the case of ChatGPT, users are able to reach a large of body information in a blink of an eye for instance. This allows them to research and learn any subject in a much more efficient and faster way. Accordingly, their professional, intellectual and academic growth is directly shaped and enhanced through this AI technology, generating many crucial questions about future scenarios for both production and economy and the potential of human intellect and agency. As this direct and ongoing interaction between AI and human beings continue and grow, the arising ethical issues such accountability, creability and the others should be tackled and considered by users, technology developers and policy makers. Accordingly, other related risks such access asymmetries to technologies and inequalities should also be paid attention to. As this current case demonstrates,

Conclusion

As we pointed out earlier, artificial intelligence-related activities will be the driving force behind future economic progress, therefore its proper integration and use are highly critical for individuals performance and economic growth of societies. The

study therefore aimed to delve deeper into this subject by also studying the users' perceptions of ChatGPT's role in enhancing or limiting their capabilities as these aspects would be a critical component of their productivity and give insights about future job market implications. This study has confirmed many of the previous studies which emphasised the positive correlation between AI and productivity but also given a broader perspective by dealing with the impressions of the ordinary users as well and the ethical issues which arise in the meantime. Overall, individuals acknowledged a predominantly positive and enhancing impact of ChatGPT in their professional lives even though they are aware that the tool itself has certain limitations and poses some ethical challenges as well. Looking at this subject from a posthumanist lens has helped us better see the dynamic relationship between human and nonhuman and the existing interplay. Lastly, on a final note, this entangled and dynamic relationship can also be interpreted as an indication of the transformative shift towards the already envisioned posthumanist paradigm.

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Appendices

Appendix 1

User Interview Guide and Interview Questions

Introduction:

After introducing myself as a researcher, participants will be provided with information about the purpose and scope of the interview.

Participants will be informed that the interview will take approximately 15-30 minutes and will involve a series of questions exploring their experiences with ChatGPT and their perceptions of its potential to enhance or limit human capabilities. Informed consent will be obtained and participants will be given an explanation of how their anonymity and privacy will be protected.

Demographic Information:

The following demographic information will be requested from participants:

Age:

Gender:

Educational background:

Occupation:

Interview Questions

Use of ChatGPT:

1. Can you explain your experience using ChatGPT and how it has impacted your daily life?
2. Where did you first hear about ChatGPT?
3. How long have you been using ChatGPT?
4. How frequently do you use ChatGPT?
5. In general, what do you use ChatGPT for?

Potential for Enhancing Abilities with ChatGPT:

1. Do you believe that ChatGPT enhances your communication skills or your ability to perform any specific tasks?
2. What tasks or jobs do you use ChatGPT for? (e.g., answering questions, generating text, translation or summarization)
3. How has ChatGPT enhanced your capabilities or skills in these tasks? (e.g., increased productivity, improved time management, enhanced quality of work)

4. Can you provide examples of tasks or work that you were able to complete more efficiently or effectively with ChatGPT?
5. Has ChatGPT helped you learn new information or skills? If yes, how?

Perceived Limitations of ChatGPT:

1. Have you noticed any limitations or disadvantages in using ChatGPT? If so, can you explain them?
2. Have you encountered any technical difficulties?
3. Have you come across situations where ChatGPT did not understand your requests or provide satisfactory/accurate answers?
4. Have you noticed any biases or inaccuracies in ChatGPT's responses? How did you address or resolve them?
5. Do you think there are specific tasks or types of information where ChatGPT is not sufficient?
6. How do you think ChatGPT is integrated into your cognitive abilities? How does it affect them?

Concerns about Security and Privacy:

1. Have you encountered any security or privacy concerns while using ChatGPT? If yes, how did you address them?

Approach to and Relationship with ChatGPT:

1. How do you perceive your approach and relationship with ChatGPT?
2. What do you think is the overall role of ChatGPT in knowledge production?

Appendix 2

Codebook

Name	References
Improve capacity	11
Positive impact	10

Help research/conduct research	11
Simplifies	8
Save time/ time management	13
Handle tasks more easily	9
Learn	13
Increase capacity	7
Worried about weakening cognition	4
Reservations about long term impact	5
Can't handle	7
Inaccurate responses to subjective topics	3
Boost creativity	3
Trust issues	4
Bias/ed	4
Concerns about security/privacy	6
Assistant	8
Right arm	5
Mentor	4
Companion/Partner	4
Limited role (in knowledge production)	4
Combine/ Build upon output /information	5

